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Intranets trip over client/server apps

By Kim S. Nash

Looking for an application to convert to an intranet? Those old-time mainframe programs may be better candidates than newfangled client/server systems.

Revamping client/server applications built with, say, Powersoft Corp.'s PowerBuilder or Microsoft Corp.'s Visual Basic is a lot tougher than making mainframe programs intranet-ready, several users and analysts said.

Mainframes are getting a new lease on life as intranet servers. Although the client/server computing architecture isn't dead, it apparently doesn't fit well in the intranet world

Intranets, *page 127*

Intranet obstacles

Users say client/server systems built in-house can be tough to convert to intranet applications for the following reasons:

- Too much application logic on the client
- Platform-specific coding not easily translated
- Client/server tools vendors lag in adding Web features to their products

Microsoft to hint at OS road map

By Laura DiDio and April Jacobs

Microsoft Corp. next week will turn up the heat on the Internet and its intranet offshoots by laying out plans to build distributed applications that integrate Windows NT desktops and servers with the Internet.

However, at its annual Professional Developers Conference in Long Beach, Calif., Microsoft will provide a limited road map for its two most important agendas: its Internet initiative, and migration and interoperability between its dual Windows 95 and Windows NT operating systems.

Microsoft has publicly stated that

OS road map, *page 127*

Merger madness miffs users

By Bob Wallace

It's the internetworking industry's version of *The Good, the Bad and the Ugly.*

Consolidation has angered some users, who say rampant acquisitions, poor financials for some major vendors and a loss of focus make it tougher for them to select — and stick with — the right vendors for long-term alliances.

Consolidation

For example, Cisco Systems, Inc. has made 14 acquisitions in three years, spending $4.66 billion in just

Merger madness, *page 16*

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ELECTION '96

In exclusive *Computerworld* columns, *Republican challenger Bob Dole and President Clinton offer differing views on the hottest high-tech policy issues. See Viewpoint, page 33.*

IS backing Dole, vendor vote split

By Gary H. Anthes and Mindy Blodgett

Despite predictions of a landslide victory for President Clinton, the election is a lot less cut-and-dried for high-tech voters. While the vendor community seems split between Clinton and Republican challenger Bob Dole, a *Computerworld* poll of 100 information systems users shows Dole leading Clinton by 13 percentage points (see stories, pages 30 and 31).

Computerworld found that although Clinton is reaping praise for some initiatives, more recently he has angered high-tech vendors. This week, a group of at least 243 Silicon Valley executives plans to publish an open letter of support for Dole.

However, a poll of 1,013 computer executives by H&M Consulting in Sunnyvale, Calif., found that 48% preferred Clinton and 39% backed Dole.

Clinton has won praise for decontrolling the export of some computers, supporting free-trade agreements and promoting use of information technology, particularly the Internet.

IS voters, *page 30*

The Economy, the Deficit and Taxes

Clinton plan: Balance the budget by 2002. Exempt $500,000 from capital gains tax on house sales. Ease rules on individual retirement accounts to allow early withdrawals in some cases. Boost grants to cities for job creation and increase education awards to needy/bright high school students.

Dole plan: Balance the budget by 2002 and support balanced budget amendment to the Constitution. Cut taxes for individuals 15%. Cut capital gains tax rate from 28% to 14%.

CW poll results: Economy Tax policy

Base: 100 IS professionals

"There's a lot of skepticism about [Dole's] 15% tax cut. ... Most Americans realize you can't reduce the deficit by reducing income to the government."

– **Arvid Larson,** chairman of the research and development task force, American Association of Engineering Societies

"If Dole gets elected, I would just like to see the guy cut our corporate taxes and cut the capital gains rate and let us compete with the Japanese and Korean high-tech industries."

– **T. J. Rodgers,** CEO, Cypress Semiconductor Corp.

The talk of '97

The network computer will he *the* computer technology story of 1997.

My opinion was confirmed last week at Agenda '97, a gathering in Scottsdale, Ariz., of the industry's powerful and filthy rich. The titans of the PC industry were obsessed about a cheap desktop device that loads its data, operating system and applications across the network. And with good reason. This unassuming machine could fundamentally shift the value structure of the PC industry.

The network computer will draw powerful support from top corporate management, IS departments and, yes, even a lot of end users. CEOs are alarmed at paying an annual $8,000 to $10,000 per employee to run software with features that aren't even used. IS departments see a chance to end the terminal upgrade cycle. And I'm convinced that many end users would jump at the chance to have a PC that doesn't crash, catch viruses or occasionally lose data.

The PC industry is worried, and that's just great. Because if the network computer does nothing more than get vendors to take cost of ownership seriously, it will have fulfilled its purpose. Bill Gates is talking about "zero-admin clients." Intel wants to put chips in your PC that make it easier to manage. Internet-based software distribution is becoming a reality.

I still believe the network computer will fail. It's been badly positioned as a hobbled PC, and the cost-of-ownership advantages have been undersold. Unanswered questions remain about operating systems and Microsoft's lack of support. But that's no matter for now. In a poll at Agenda, nearly half the attendees said they believe the device will be commercially successful. That's a powerful message from a PC audience. And it may prod the industry to finally address that nagging cost-of-ownership issue.

Paul Gillin, Editor
Internet: paul_gillin@cw.com

The 5th Wave by Rich Tennant

"Of course it was a tragic mistake, Mr. Hamlin. Someone inadvertently left the Mr. Potato Head game running on the operating-room monitor."

Dueling SNA schemes set

By Laura DiDio

The Novell/IBM team and Microsoft Corp. are set to introduce rival SNA software that makes it easier for large organizations to access mainframe data from their desktops.

Analysts and users said SNA gateway software from Microsoft Corp. and from a joint Novell, Inc./IBM initiative will provide users with enhanced features.

LAN/mainframe access

Simpler access

"Both the Novell/IBM NetWare for SAA 2.2 and Microsoft's SNA Server 3.0 simplify and solidify access methods between legacy IBM SNA mainframe and AS/400 hosts and their LANs," said Lucinda Santisario-Borovick, an analyst at International Data Corp. in Framingham, Mass.

NetWare for SAA Version 2.2, slated to ship by year's end, will offer several key enhancements, including support for 32-bit application programming interfaces for Windows 95 and Windows NT and native support for Novell Directory Services (NDS) in NetWare 4.11. That means users won't have to run NetWare 3.1 bindery emulation to access information in NDS directory trees.

Microsoft will ship its rival SNA Server 3.0 software early next month, said Vesa Suomolainen, general manager of Microsoft's SNA Server product unit.

The first major upgrade of SNA Server in more than a year supports 5,000 concurrent user sessions and 15,000 host sessions, up from 2,000 user sessions and 10,000 host sessions.

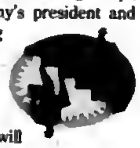
The upgrade also includes a new data-encryption facility, a single-user sign-on to AS/400s and mainframes that eliminates multiple passwords and a service that allows PCs without SNA client software to access "shared folders" files on AS/400s.

Neither Novell nor Microsoft would disclose pricing.

News Shorts

AT&T president named

AT&T Corp. last week named John R. Walter, head of R. R. Donnelley & Sons Publishing Corp., as the company's president and chief operating officer. Under the AT&T succession plan, Walter, 49, will split the role of AT&T chairman and CEO with Robert Allen, 61, beginning in January 1998. He is expected to take full charge of the telecommunications giant later that year. Walter replaces Alex Mandl, who left AT&T in August to head a small wireless communications start-up. Walter's hiring comes just as AT&T is struggling to fend off competition, sort out its reorganization and plan a strategy for entering the local market.



Informix plays catch-up

Informix Software, Inc. has announced data replication and distributed database management tools to compete with rival Oracle Corp. Informix officials said the company's Enterprise Command Center for managing multiple databases from a central console answers Oracle's Enterprise Manager released last summer. Informix plans to link its offering with third-party tools that can manage competing databases from Oracle, Sybase and IBM.

Visual Age family grows

IBM is releasing Visual Age for Basic this week at the Software Development '96 East conference. The latest edition to IBM's Visual Age family was designed to enable developers to visually script programs that cross both platform and language boundaries using the Basic programming language. Visual Age for Basic will be available from IBM's software site on the World Wide Web at www.software.ibm.com. The Visual Age family is an object-oriented development approach with major offerings for Smalltalk, C++ and Cobol. Visual Age for Java is expected by the end of the year.

Oracle enhancements

Oracle plans to introduce a trio of offerings that combine an enhanced version of its Workgroup Server database with its Web-Server software and a variety of tools, industry sources said. The Workgroup Server release borrows code from the Oracle7.3 enterprise server to support parallel query processing and bit-mapped indexes, the sources said. The bundles initially support Windows NT and may be introduced at next week's Oracle OpenWorld conference.

Borland loses $9.8M

Borland International, Inc. last week reported a net loss of $9.8 million, or 31 cents per share, for its fiscal second quarter ended Sept. 30. The figures match preliminary results the company announced last month. Revenue totaled $36.4 million, compared with $51.3 million during the same quarter last year. Borland officials said revenue declined because the company hasn't changed its sales, marketing and development efforts fast enough to satisfy corporations developing client/server, Internet and intranet software.

Compaq plans handheld

Compaq Computer Corp. in Houston has jumped on the bandwagon for Microsoft Corp.'s new operating system for handheld devices, Windows CE. Compaq recently announced plans for a handheld device that will run on the Windows CE platform and work with other Windows-based desktops and laptops. The pocket-size device will provide users with Personal Information Management capabilities, electronic mail, word processing and spreadsheet applications and an Internet browser. The device, which will cost between $500 and $1,000, will be available later this year.

BMC on NT bandwagon

BMC Software, Inc. in Houston this week plans to update NetTune Pro, its popular software for tuning network server performance, to handle Windows NT servers. With Version 3.0, NetTune Pro users can automate performance analysis of Windows NT and Novell, Inc. NetWare servers while adjusting network service to end users' needs. Pricing starts at $895.

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Oct. 28, 1996

News

NEWS

Access problem
PSInet sold 100,000 customers to a competitor; users say the new service stinks.

Temp or employee?
Microsoft ruling puts every company that uses contractors in the hot seat.

Networkers wanted
Networking skills are in high demand, pushing up salaries and recruitment.

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IS regulation
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IBM/Lotus surprise
Notes: Users like the product, hate IBM's service, David Moschella says.

Keeping up with Microsoft
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Shaky structures
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Most IS people are introverts, but that doesn't mean they can't be leaders.

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Digital backs Tivoli, hands off NetView

By Patrick Dryden

Tivoli Systems, Inc. this week plans to announce an agreement under which it will acquire Digital Equipment Corp.'s NetView development group, and Digital will resell Tivoli's management products.

Also scheduled to be announced this week at the Tivoli Partners Conference in Austin, Texas, are details about a scaled-down version of the Tivoli Management Environment (TME 10) designed to manage applications on small networks.

TransQuest's John Cahill: *The firm is 'trying to build a central view of all systems and network components'*

Administrators said the new products and partnerships will bring them closer to the day when they can control distributed business functions without having to link and monitor many separate tools.

Besides reselling TME 10, Digital will transfer to IBM-owned Tivoli the engineers and technology it has developed in its effort to create a Windows NT version of IBM's NetView network manager.

NT support

The technology and extra staff will help Tivoli strengthen its efforts to provide more support for Windows NT in its products and improve NetView, both as an independent product and as a component of the TME 10 suite, said Frank Moss, president of Tivoli.

The move gets Digital out of the management software business and lets it act as an independent service provider, supporting whatever platform is best for a particular customer, said Paul Mason, an analyst at International Data Corp. in Framingham, Mass.

Tivoli rival Computer Associates International, Inc. recently acquired Polycenter, AssetWorks and other tools from Digital.

"Everything but the NetView piece went to CA, so this makes sense all around," Mason explained.

For Tivoli user Charles Schwab & Co. in San Francisco, the move marks a step toward the promised integration of network and systems management functions, said Richard Weiss, an architect for enterprise management systems at the company.

But users said Tivoli must complete this integration and prove such benefits before users can consider switching to TME 10 NetView from their chosen network management platform.

"We don't want to feel forced into adopting anything," said John Cahill, assistant vice president of production services at TransQuest, Inc., the Delta Airlines information services subsidiary in Atlanta.

Cahill and other Tivoli users in large organizations said they chose TME 10 because it can work with whatever network and systems management tools they prefer.

Smaller businesses should be able to apply a scaled-down version of the TME 10 suite early next year that eases management of specific applications, Moss said.

Tivoli will put a simpler interface on a set of tools for administrators responsible for fewer than 1,000 desktops and a few dozen servers, Moss said.

The model is a kit that costs less than $6,000 and helps distribute and maintain PowerBuilder applications for Powersoft Corp.

O'Reilly's Website Professional 1.0

Buyer's Guide

Web server shakeup

Web server review places small developer O'Reilly & Associates first, Microsoft second and Netscape third.

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Visual developments
Visual Basic skills are among the hottest sought by IS managers. Preview an excerpt from our upcoming annual Skills Survey.

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www.computerworld.com/emmerce

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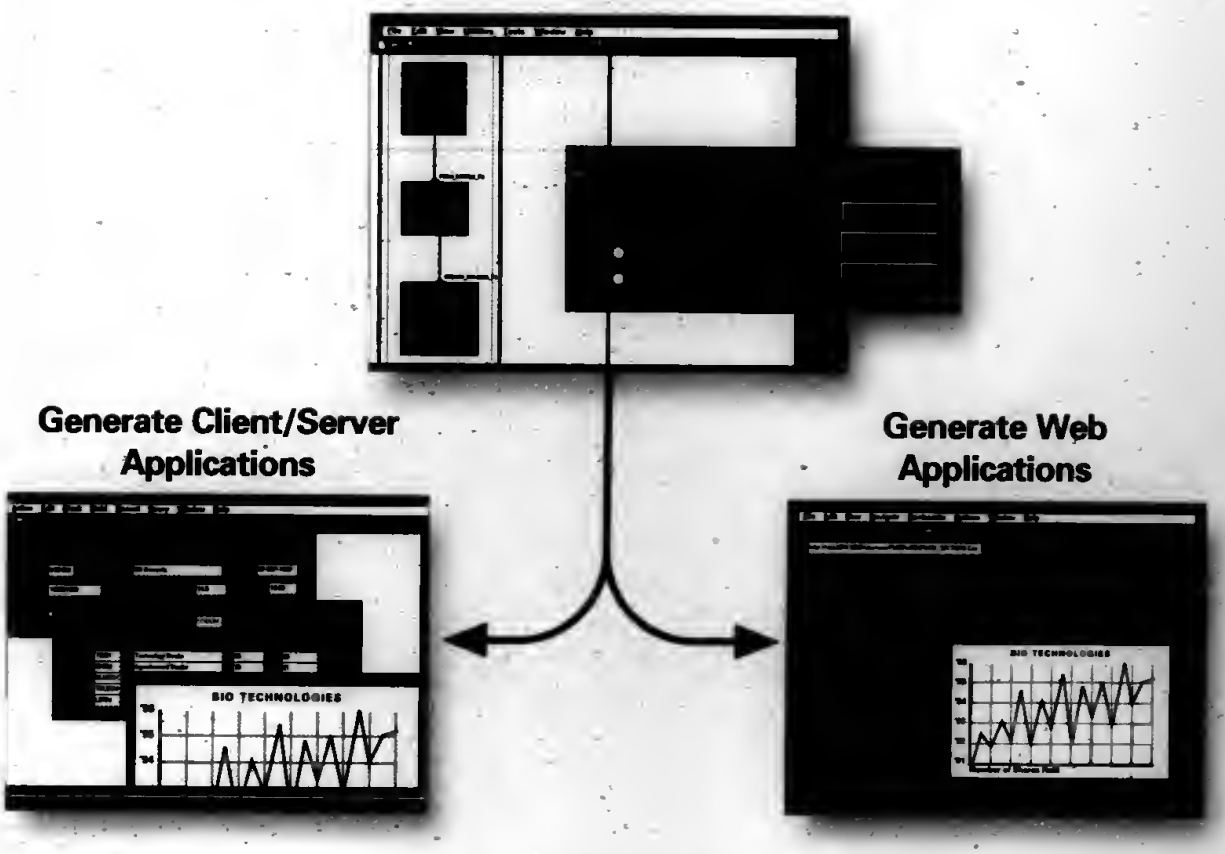

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Oracle leaves users behind the '8' ball

By Craig Stedman

Users expecting next week's Oracle OpenWorld conference to clear up some of the mystery surrounding the long-promised Oracle8 database should prepare to don their sleuth hats.

Oracle Corp. promised two months ago to divulge more details about Oracle8 at the San Francisco event, which combines separate conferences for users and developers.

But the company has changed gears and plans to keep Oracle8 mostly in the background, officials said. Oracle instead will push its network computer and network infrastructure into the limelight.

Several "sneak peek" presentations on Oracle8 are scheduled to take place at Oracle OpenWorld. But the company doesn't plan to highlight the upcoming database in any focused way, an Oracle spokesman said.

Rich Malone, *CIO at Edward D. Jones, wants Oracle8 for data warehouse support*

And still counting

Oracle expects up to 15,000 people to attend Oracle OpenWorld, including users, developers and exhibitors, said Zach Nelson, the company's vice president of marketing. As of last week, about 8,000 attendees had registered for the conference, he added.

Sometime next year

That leaves users still wondering just when Oracle8 will become available. Oracle began limited beta testing of the next version of its database last summer, but, thus far, it has said only that the final release will ship at some point next year.

That doesn't pin things down nearly enough, said several users who are trying to track the development of Oracle8.

The whereabouts of Oracle8 "is on my list of questions" for Oracle, said Rich Malone, chief information officer at Edward D. Jones & Co. in St. Louis. "I've asked them that before, but they've been reluctant to give dates, at least firm ones."

Edward D. Jones, a brokerage firm, is developing a series of Oracle-based applications for a new client/server network that is being installed at its headquarters and 3,400 branch offices. Malone said he is counting on Oracle8 to provide faster performance and improved support for data warehousing.

The biggest change coming with Oracle8 is support for blending relational and object technologies so the database can manage complex forms of data such as images, text, audio and video.

That kind of multimedia capability will be crucial for future Internet-based applications aimed at attracting prospective customers, said Hugh Allan, database manager at Dunlop Tire Co. in Amherst, N.Y. For example, Dunlop could allow its customers to view and manipulate images of tires before making a purchase, he said.

But the hybrid database approach has potential performance drawbacks that Oracle needs to address, Allan added. "I'm just not sure that object and relational technology are a real good mix," he said. "And we really don't hear too much about Oracle8 at this point from our sources in Oracle."

Oracle this year announced a Universal Server package that includes its relational database plus separate servers for video and other data types.

But that still can cause "data and content management headaches" for users because the engines aren't integrated the way they will be in Oracle8, said Donald A. DePalma, an analyst at Forrester Research, Inc. in Cambridge, Mass.

User groups kiss and make up

How many conferences can Oracle users stomach in a year?

That answer will come next week at Oracle OpenWorld. It is the first to take place since Oracle and its national user group settled a nasty dispute by agreeing to run separate shows in the fall and spring.

Each organization will participate in the other's event.

The International Oracle Users Group-Americas (IOUG-A) put together the technical sessions program for Oracle OpenWorld.

Oracle will exhibit and deliver a keynote speech and some presentations at the IOUG-A's conference in Dallas next spring.

But Oracle controls the agenda for Oracle OpenWorld and is making it "more Oracle-myopic" and marketing-driven than the IOUG-A's conference, said Michael Corey, a director of the user group and head of its conferences operation.

Left open for now is whether the IOUG-A will again handle the technical sessions for next year's Oracle OpenWorld. The two sides are interested in continuing the mutual back-scratching, "but that hasn't been put into writing yet," Corey said.

Zach Nelson, vice president of marketing at Oracle, said the company hopes to keep the IOUG-A involved in the company-run conference. "I'm 100% confident that we'll find a way to do it again," he said.

— Craig Stedman

'net provider buyout undermines service

By Mitch Wagner

An Internet service provider has made a bold play to go straight from the minor leagues to the World Series. But disgruntled users may just send MindSpring Enterprises, Inc. back to the showers.

The Atlanta company signed an unusual contract this summer to buy about 100,000 dial-up customers from PSInet, Inc. in Herndon, Va., which will help catapult MindSpring's subscriber base from 49,000 in June to 135,000 by year's end.

But thousands of users, who either have to go with MindSpring or switch to a different service provider, are finding the switch from PSInet to MindSpring rough going. Electronic mail is getting lost or delayed, sometimes for up to weeks at a time. And MindSpring's technical support staff hasn't been helpful, users said.

"They're just saying, 'We're sorry, we're sorry, we're sorry.' That's what the Menendez brothers said," said Larry Hertzog, a television producer in Los Angeles and a MindSpring user.

"The whole idea of not getting E-mail is horrific," said user Mike Freeman, president of CASE Technology Consulting, Inc. "It's difficult to stay in touch with your customers and your associates [otherwise]."

Internet service providers

Users who are experiencing problems appear to be mostly consumers and small businesses. But dial-up Internet access is also an issue for businesses that use dial-up accounts to support mobile workers, telecommuters and traditional office workers who log in from home on evenings or weekends.

MindSpring blamed PSInet for many of the delays, saying PSInet failed to provide sufficient technical support for the transition. But PSInet said it wasn't involved in MindSpring's customer support. "[The] general issue of customer support/administration rests squarely in the hands of MindSpring," said Brian Muys, a spokesman for PSInet.

MindSpring specializes in dial-up accounts and World Wide Web site hosting, with customers split about half-and-half between consumer and business accounts. Some of its large corporate customers include The Coca-Cola Co., Turner Broadcasting System, Inc. and Lockheed Martin Corp.

Among the companies affected by the transition was Computerworld, Inc., which used PSInet — and now uses MindSpring — for some of its dial-up Internet access.

MindSpring is only the most visible example of growing user unrest with the declining quality of customer support available for Internet service. For instance, customers of Netcom On-Line Communication Services, Inc. are complaining of delays of up to two weeks in getting responses to their requests for technical support. And they said they are spending up to an hour on hold.

Netcom acknowledged the problems and said the company is staffing up and investing in additional help desk automation to speed up responses to requests for technical support.

"We are aware that delays are longer than we like, and we are taking steps to address the delays," said Eric Goffney, vice president of customer support.

Critics say many Web sites don't lure new business. See page 61.

Internet and online service providers left users tied up in knots this year:

BBN Planet:
400 business users were left without Internet service for a day because of a power outage in Stanford, Calif.

America Online:
6 million users lost service for a day because of router configuration problems.

Netcom On-Line Communication Services:
400,000 customers nationwide were left without service for 13½ hours when a programmer error in a router table crashed the network.

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MindSpring blamed PSInet for many of the delays, saying PSInet failed to provide sufficient technical support for the transition. But PSInet said it wasn't involved in MindSpring's customer support. "[The] general issue of customer support/administration rests squarely in the hands of MindSpring," said Brian Muys, a spokesman for PSInet.

MindSpring specializes in dial-up accounts and World Wide Web site hosting, with customers split about half-and-half between consumer and business accounts. Some of its large corporate customers include The Coca-Cola Co., Turner Broadcasting System, Inc. and Lockheed Martin Corp.

Among the companies affected by the transition was Computerworld, Inc., which used PSInet — and now uses MindSpring — for some of its dial-up Internet access.

MindSpring is only the most visible example of growing user unrest with the declining quality of customer support available for Internet service. For instance, customers of Netcom On-Line Communication Services, Inc. are complaining of delays of up to two weeks in getting responses to their requests for technical support. And they said they are spending up to an hour on hold.

Netcom acknowledged the problems and said the company is staffing up and investing in additional help desk automation to speed up responses to requests for technical support.

"We are aware that delays are longer than we like, and we are taking steps to address the delays," said Eric Goffney, vice president of customer support.

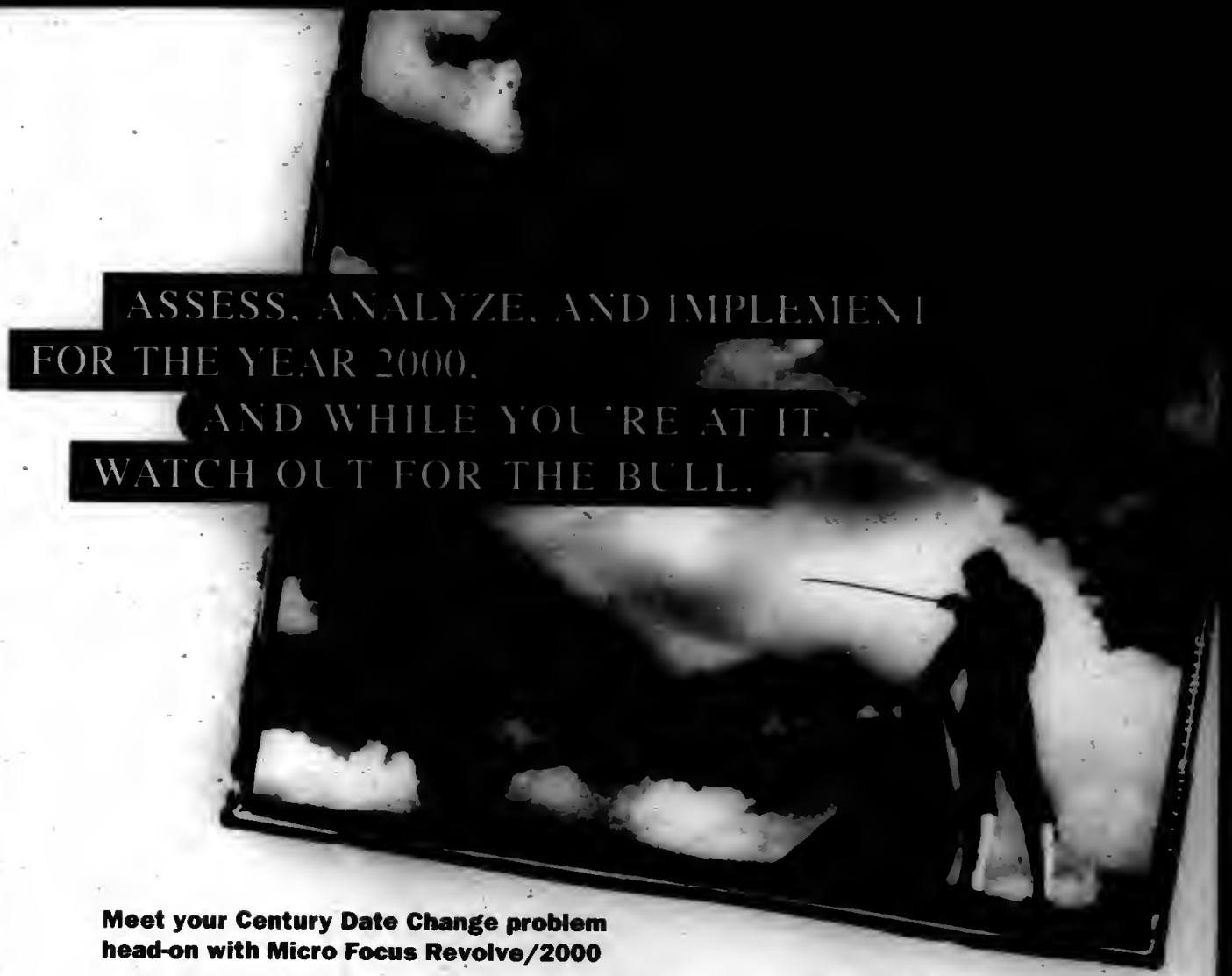
Critics say many Web sites don't lure new business. See page 61.

Internet and online service providers left users fed up in knots this year:

IBM PLANET: 400 business users were left without Internet service for a day because of a power outage in Stamford, Calif.

AMERICA ONLINE: 6 million users lost service for a day because of router configuration problems.

NETCOM ON-LINE COMMUNICATION SERVICES: 400,000 customers nationwide were left without service for 23½ hours when a programmer error in a router table crashed the network.



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Transforming Enterprise Systems **MICRO FOCUS®**

Sun client undercuts PC costs

By Sharon Gaudin and Frank Hayes

By charging roughly $800 for an entry-level machine, Sun Microsystems, Inc. is positioning its network computer as a cheaper-to-buy-and-run alternative to traditional PCs.

Sun will officially unveil its Java Station tomorrow in New York, flanked by a dozen major corporate customers and software vendors.

Sun hasn't yet released official specifications for its network computer, but *Computerworld* has learned that it will cost between $800 and $1,500, depending on the hardware package.

The machine is expected to be powered by a Sun SPARC chip. It will have 8M bytes of RAM, run the Java operating system — the Java Virtual Machine — and use Sun's Hot Java as a World Wide Web browser.

Java Station is almost as deep as a typical PC but only about 40% as wide, according to Evan Quinn, an analyst at International Data Corp. in Framingham, Mass.

Java Station targets terminal-style applications. "Their initial market thrust is heads-down environments — customer inquiry, phone order-taking, classic data," Quinn said. "Their goal is to have no moving parts initially. They want companies to keep two or three spares in a closet. When one [network computer] fails, take it out, and send it back to the vendor. They plug in another, and they're back in business."

Network computers

Unlike PCs, network computers — or thin clients — download software across a network when needed. This can make applications much easier and less expensive to manage.

Joining the crowd

Sun is the third major vendor to enter the network computer market in recent months. IBM in September introduced its Network Station, a $700 machine for business users. Oracle Corp., one of the more fervent supporters of network computers, is also developing a network computer that is expected to debut in a few months.

"Supporting PCs is getting very expensive," said Larry Hagerty, a senior systems analyst at Tampa, Fla.-based GTE Data Services, a subsidiary of GTE Corp. "Sun's network computer would be a nice solution where you don't need the power of the PC, and you don't want all the headaches."

GTE has been testing Sun's network computer prototype, and Hagerty said the company may use them in kiosks and call centers.

Among the developers that will join Sun at Tuesday's announcement and show off software supporting Java Station are the following:

- Visual Components, a wholly-owned subsidiary of Sybase, Inc., will demonstrate Formula One/Java, a Java-based version of its Formula One spreadsheet.
- Oracle will demonstrate its Developer 2000 for the Web, which will run existing client/server applications on the server so they can be accessed from a browser.
- SunSoft, a subsidiary of Sun, will announce Project Studio, which will let developers produce disposable applications from JavaBeans components without writing any code; Project Ice Tea, which was designed to connect Java clients to legacy systems; and Project Speedway, which is expected to make Java applets run faster.

Java in a box

Size:	4 by 6 by 14 in.
Processor:	Sun SPARC
RAM:	8M bytes
Operating system:	Java OS
Web browser:	Hot Java
Network adapter:	Ethernet
Price:	$800 to $1,500

Java has weaknesses, but developers are still committed. See page 45.

Court ruling spurs look at temporary workers

By Julia King

Companies that use contract programmers and other outside software personnel should take a break from systems development to double-check the employment status of their IS workers.

In the wake of a recent court decision that entitles hundreds of former freelance workers at Microsoft Corp. to back benefits, experts said information systems managers should learn the rules for determining whether a worker is classified as an employee or independent contractor.

"The Microsoft case has brought to the fore a lot of questions that have been lurking," said New York computer lawyer Esther C. Roditti. "Companies need to perform an internal audit and see who they've got on board and on what basis," she advised.

Clarify the rules

After that, "they need to tighten their own eligibility provisions so it's clearly stated who is and who isn't eligible for any company benefits," said Bill Sweetnam, a technical consultant at Towers Perrin, Inc., a compensation and benefits firm in Valhalla, N.Y.

Earlier this month, a federal appeals court ruled that several hundred temps who worked at Microsoft between 1987 and 1990 are eligible for some retirement benefits because they were treated like employees [CW, Oct. 14].

Employee or contractor?

- Must comply with employer's instructions about work
- Receive training from the employer
- Must follow set hours of work
- Work for one employer at a time
- Can be fired by the employer
- Rely on the employer to furnish tools and materials

Source: IRS Manual 4600 - Employment Tax Procedure

IS managers in virtually all large companies routinely bring in outside contractors to supplement staffers on systems projects. Although the paperwork is typically handled by a company's human resources department, the legal test of a worker's employment status is how he or she is treated on the job.

The Internal Revenue Service has set 20 guidelines for determining whether workers are employees or contractors (see chart above). But without knowing the rules, IS project managers could easily, and unintentionally, violate them and cost their company millions of dollars in the process.

For example, "if a company is supervising a person in their day-to-day activities, has set the pay rate and is suggesting when the person comes to work and leaves, that person is going to be viewed as an employee at the end of the day," said Ray Marcy, CEO of Interim Services, Inc. in Fort Lauderdale, Fla. "The more a person is supervised, the more a person's an employee."

But at a time when companies are scrambling to snare hard-to-come-by technical talent, "no one's really monitoring" the situation, said Cheri Comstock, an IS recruiter at The Focus Group in Chapel Hill, N.C.

To get around those and other pitfalls, Dick Brightman, vice president of IS at Liberty Travel, Inc. brings in only contractors who are employees of outside consulting companies.

"That way, there is a clear relationship between us and the consulting corporation. You don't have to worry about baby-sitting individuals," Brightman said.

Package to aid Web recruiting

By Julia King

Electronic job postings and Internet recruiting services have made life a lot simpler for job hunters. Sending a resume involves little more than clicking a mouse around a World Wide Web page.

But on the receiving end, an electronic avalanche is hitting human resources organizations. Many employ a full-time staffer just to send out paper or electronic-mail receipts for the thousands of applications that pour in each week.

That is the business dilemma that Netstart, Inc. in Reston, Va., aims to solve with an Internet recruiting platform that combines resume management software with an Internet job search site. The company will announce its client/server-based TeamBuilder software as well as its CareerBuilder Web site (www.careerbuilder.com) today.

Pricing for the Windows NT-based software ranges from $4,500 to $6,000, depending on configuration. Posting 25 job openings to CareerBuilder costs $2,000 a month.

It is the ability to manage Web-based resume information that differentiates Netstart from other Internet recruiting models, said Bill Bass, an analyst at Forrester Research, Inc. in Cambridge, Mass.

"Internet recruiting is already huge," Bass noted. "But by 2001, the $4 million that companies spend posting jobs online this year will be about $330 million. Netstart's success will come from managing all of the internal HR matters."

Netstart's TeamBuilder software automates dozens of time-consuming tasks surrounding the recruiting and hiring process. Those include reviewing and routing resumes, replying to candidates via E-mail and measuring results of recruiting programs.

Wizard work

Using a built-in wizard, the workflow-based software also allows human resources personnel to build their own Web pages to dynamically post and update job openings.

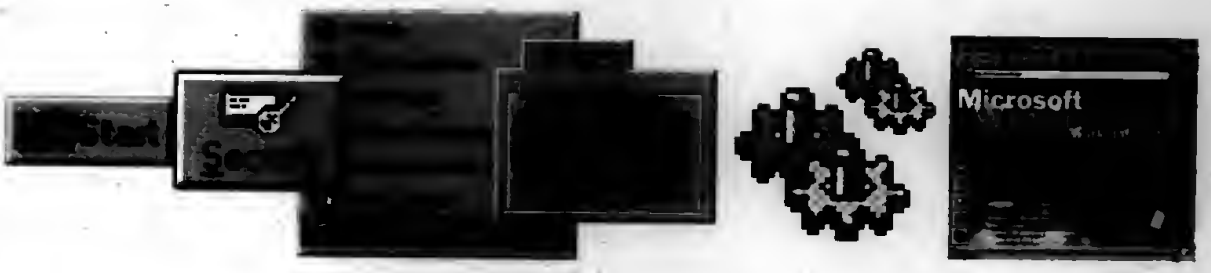
Those openings can be posted to Netstart's CareerBuilder job site and eventually to The MonsterBoard (www.monster.com) and Career Mosaic (www.careermosaic.com), which together list tens of thousands of jobs.

New Web forum features online shoptalk for CIOs. See page 69.

Microsoft Windows NT Workstation 4.0

has the ease of Windows 95. It has the power of Windows NT.

It has computers everywhere drooling.



The Windows NT® Workstation operating system has always been powerful, and now it's easier to use. It's easier because all that power is now controlled by the familiar Windows® 95 interface. And besides having TCP/IP and the Microsoft Internet Explorer browser built-in for easy Internet access, Windows NT Workstation 4.0 has integrated Peer Web Services which lets small workgroups easily create their own intranets. Windows NT Workstation is also more reliable. It protects you from crashes because all applications run in their own memory space. Integrated security ensures applications and data are safe from user error or tampering. Windows NT Workstation 4.0 also helps administrators manage networks better by letting them troubleshoot remotely, viewing individual systems from their desktop. So does all this mean Windows 95 is history? Absolutely not. Windows 95 may still be the best choice for some users, depending on existing hardware and applications. We suggest you visit our Web site to compare and contrast operating systems to see which 32-bit desktop is best for you. Think of it as a test drive without the annoying sales-guy.

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High demand for network gurus boosts pay

By Kim Girard

Type the word "networking" into the employment section of Hewlett-Packard Co.'s Web site and dozens of job listings pop up.

Repeat the process on other World Wide Web pages for top companies and the trend becomes apparent. "Demand in the marketplace [for networking skills] is outrageous," said Patricia Lopez, an associate at Fenwick Partners, a recruiting firm in Lexington, Mass.

Lopez said the job market took a major jump in the past two quarters. "We're getting to the point where folks in networking see how attractive they are to the big boys."

And they are demanding compensation for it. A *Computerworld* skills and salary survey, to be published Nov. 18, shows that networking employees with TCP/IP experience are paid an average of 10.3% above the set salary for that skill.

Career spotlight

Salaries range from $60,000 to $70,000 for technical specialists and $70,000 to $80,000 for project leaders. Contractors earn an average of $50 and up to $90 per hour.

Increases in mobile computing, corporate intranet development and demand for Internet access have spurred the need for more temporary and full-time networking experts. According to the survey, more than 40% of information systems managers plan to hire staff with IBM's peer-to-peer networking experience in the next year.

Networking consultants are a hot commodity for companies that offer complete network installations to customers, said Bruce Hatz, corporate staffing manager at HP in Palo Alto, Calif.

"If you look at Cisco [Systems, Inc.], they're hiring like crazy, and we're pretty much competing for the same talent," Hatz said. "It's a real scramble to get top talent in the LAN/WAN environment."

Record surge

That is a fact that Keith Grossich, executive director of IS and technology services at Blue Cross/Blue Shield Association in Chicago, knows all too well.

"The demand for people with local and wide-area skills and client/server is overwhelming," said Grossich, whose staff is a mix of consultants and full-time employees. "I've been in data processing since 1972 and haven't gone through a surge like this."

He said he is looking for LAN and WAN employees to implement client/server applications and handle capacity planning.

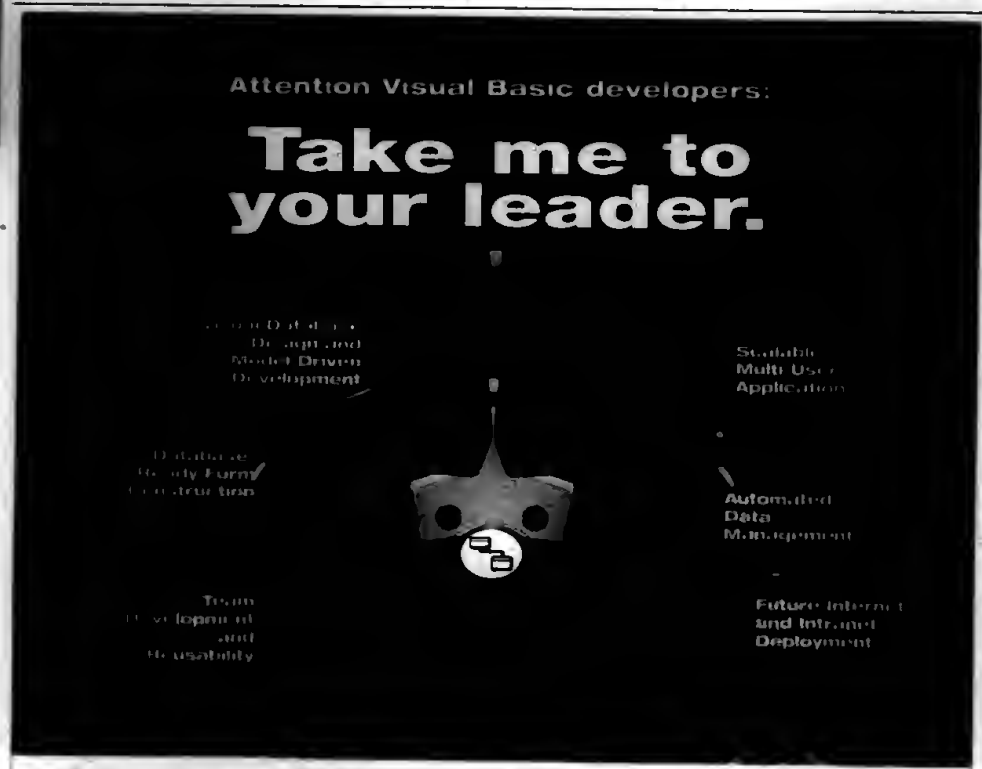
"An application is written and tested with 15 users, and now it's rolled out on 500 to 1,000 PCs. What'a it going to do to your network?" he said.

Companies are demanding network troubleshooters who can tweak a router or monitor a frame-relay network. They also are seeking end-to-end WAN designers, who are even harder to find, said Louis M. LaMattina, manager of network services at Seek Consulting Group in Wakefield, Mass.

An administrator who knows how to build an intranet, integrate it and install a firewall is a hard find, LaMattina said. About 90% of the candidates his company places work as consultants, he said.

Evelyn Smith, a senior systems engineer at AG Communications Systems, a telephone switch maker in Phoenix, said it is getting increasingly difficult to find candidates with higher-level networking skills. The company has responded by offering broader WAN training for everyone.

New Web forum features online shop talk for CIOs. See page 69.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Constant at Compaq: Exec exodus

By Jaikumar Vijayan and Kim S. Nash

The impending exit of Compaq Computer Corp.'s No. 2 executive has raised questions about whether the PC maker's blistering pace of change is driving people away.

In what seems to be a continuing exodus of top managers, Houston-based Compaq last week announced the resignation of Ross Cooley, its senior vice president and general manager in North America.

Cooley will become chairman and CEO of PcOrder.com, an electronic commerce firm in Austin, Texas, on Oct. 31.

Cooley is the eighth senior executive to leave Compaq in the past six months and the second this month. Mark Canepa, who was hired from Hewlett-Packard Co. to lead Compaq's new workstation division, quit earlier this month after just two weeks at his post.

Compaq's Ross Cooley *is the second senior executive to leave this month*

Others who have quit Compaq in the last few months include Gary Stimac and Gene Austin, Compaq's main server architects; Mike Lambert, vice president of marketing in North America; and Mike Norris, who handled Compaq's channel partners.

Cooley, who has been with Compaq since 1984, is widely considered responsible for building Compaq's distribution channels and was one of its most visible spokesmen. Rumors of his retirement have been floating around for some time, but his decision to quit surprised observers.

"I was blown away. Cooley's been a rock over there," said Jim Greene, an analyst at Summit Strategies, Inc. in Boston. "There's nothing visibly amiss, but you've got to wonder what's under the covers."

"They are losing their biggest cheerleader for the channel just at a time when they need channel relationships the most," said Joe Ferlazzo, an analyst at Technology Business Research, Inc. in Hampton, N.H.

Compaq last week downplayed the string of high-level departures and attributed the resignations to personal reasons on the part of each executive. But analysts speculated that the resignations could be a direct result of the rate of change at Compaq. CEO Eckhard Pfeiffer's goal of making Compaq the third-largest computer vendor in the world by 2000 has pushed the company in several directions at once.

Corporate change

In the past year, Compaq has started an internetworking division, a workstation business, acquired two companies and accelerated its push into the enterprise server arena.

It also appointed Richard Snyder to the newly created position of senior vice president and general manager, worldwide sales, marketing, service and support. Among those reporting to him will be James Schraith, who replaces Cooley as the vice president of the North America unit.

"There is some real intense pressure on executives at Compaq these days," said John Dunkle, president of Workgroup Strategic Services, Inc. in Portsmouth, N.H.

One user said he won't worry onless Compaq products begin to falter. "The departure I found most troublesome was Gary Stimac," said Jim Marra, a corporate director of technical planning at Partners HealthCare System.

The Boston-based managed health care group has standardized on Compaq ProLiant servers and runs 100 of them in several Massachusetts sites.

Despite the loss of its top executives, Compaq's business keeps rolling along.

In the last quarter, the firm reported earnings of $350 million, up 43% from the comparable period last year.

Compaq workstation invasion may drive down low-end prices

By Jaikumar Vijayan and April Jacobs

Users are likely to win big in what is shaping up as a bruising battle for the low-end workstation market.

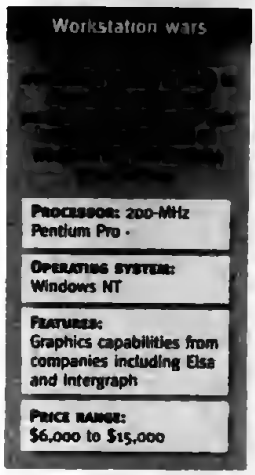
Compaq Computer Corp. in Houston will set the stage this week when it announces a line of Intel Corp. Pentium Pro-based Windows NT workstations. The workstations cost between $5,000 and $15,000 range. They are expected to lead the Wintel charge into the low-end Unix workstation space.

Analysts said that is likely to have the following effects:

- All workstation prices could drop rapidly io the next year. Previously, cash-rich Compaq has used its enormous PC manufacturing volumes to buy market share and drive down prices. Analysts expect Compaq's presence to have the same effect in the lowеod workstation market.
- Compaq's entry also is expected to speed the trend among software vendors to port Unix workstation software to Windows NT

Some of that has already begun with the entry of Unix vendors such as Hewlett-Packard Co., Digital Equipment Corp. and Intergrapb Corp. in the NT market.

"Most of the groundwork has been laid by other vendors already. What was really needed [for Wintel workstations] to take off was a mass-market player," said Terry Bennett, president of The Bennett Co. in Portland, Ore.


Workstation wars
PROCESSOR: 200-MHz Pentium Pro
OPERATING SYSTEM: Windows NT
FEATURES: Graphics capabilities from companies including Elsa and Intergraph
PRICE RANGE: $6,000 to $15,000

Pompi Malik, manager of information systems at Brewers Retail, Inc. in Mississauga, Ont., said Compaq's arrival will be welcome from a price and performance standpoint.

"It's not just Compaq we're interested in," Malik said. "We've seeo some very aggressive pricing from HP as well, and quite frankly, all of this is great."

Despite its potential to set the pace in this market, Compaq's success isn't assured, analysts said. For one thing, rivals such as HP and Digital bring years of experience servicing and selling to the Unix workstation market. Those firms have installed bases to work from and long-established ties with software vendors and distribution partners.

Compaq only recently set up a separate workstation division and is building a support and distribution infrastructure.

The higher-end Unix workstation market also may be a difficult nut to crack. Unix workstations from vendors such as Sun Microsystems, Inc. and Silicon Graphics, Inc. pack a lot more power and features than Compaq's boxes and are likely to continue dominating the higher-margin mid-range and high-end markets.

Io the short term, "I don't think any of the PC vendors will be able to compete in the traditional Unix workstation space," said Chris Goodhue, an analyst at Gartner Group, Inc. in Stamford, Conn.

"If you want to get the most out of high-performance workstations, you might [still] need to pay $20,000 to $50,000," Goodhue said.

Rewritable CDs are near blastoff

By Matt Hambleo

Business PC users by March could replace their floppy disks with high-capacity CDs that can be writteo upon and edited over.

CD-ReWritable — CD-RW — technology took another step toward legitimacy last week when five major companies announced standards to produce CD-RW discs and drives for sale in the first quarter next year.

Whether the $1 floppy disk gets replaced by the $20 to $25 CD-RW disc is an open question. The CD-RW disc can hold 680M bytes of data — roughly 500 times the 1.4M-byte capacity of a floppy.

Philips Electronics North America Corp. in San Jose, Calif., said it will ship a CD-RW drive with adapter card and software that will cost less than $1,000.

But the price of the drive will have to drop to $750 or even $500 to get the market moving, said Ray Freeman, an analyst and president of Freeman Associates, Inc. in Santa Barbara, Calif. CD-ROM drives cost $100. Hewlett-Packard Co., Ricoh Corp., Sony Electronics, Inc. and Mitsubishi Chemical America, Inc. also will make CD-RW discs or drives.

AOL offers junk-mail protection

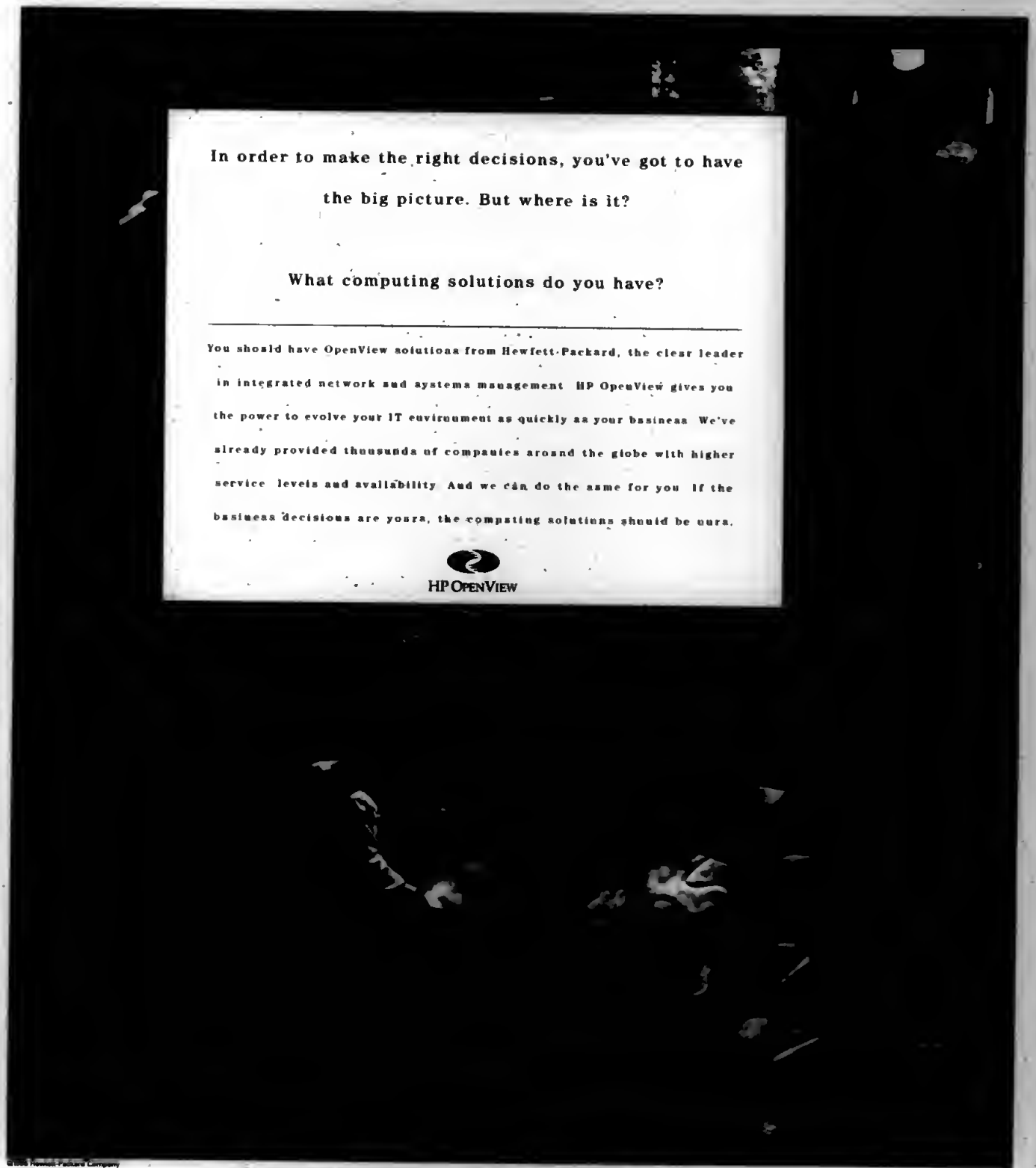
America Online, Inc. last week instituted filters to block E-mail from about 50 sites it has identified as sources of junk mail sent to its customers.

Users can switch off the filters in the PreferredMail program, unlike in earlier blocks.

Earlier this fall, bulk E-mailer Cyber Promotions, Inc. won a court order that stops America Online from blocking E-mail from Cyber Promotions domains; a judge said the blocks were a free-speech violation. America Online officials said the new filters replace the earlier ones.

Users with a lot of time on their hands who want to switch off the filters can go to the keyword "PreferredMail" and check the "I want junk E-mail!" option. More important, informatioo systems managers who want to see America Online's list to use in their own junk mail filters can find the list at the same keyword location.

Meanwhile, CompuServe, Inc. last week won a restraining order that blocks Cyber Promotions from using CompuServe accounts to send E-mail, referencing CompuServe accounts or making it appear in any way that CompuServe is involved in Cyber Promotions' junk mailings. — *Mitch Wagner*


In order to make the right decisions, you've got to have the big picture. But where is it?
What computing solutions do you have?
You should have OpenView solutions from Hewlett-Packard, the clear leader in integrated network and systems management. HP OpenView gives you the power to evolve your IT environment as quickly as your business. We've already provided thousands of companies around the globe with higher service levels and availability. And we can do the same for you. If the business decisions are yours, the computing solutions should be ours.
HP OPENVIEW

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Apple cuts prices, but PC users don't bite

By Lisa Picarille

Deep price cuts on some of Apple Computer, Inc.'s consumer and low-end business systems are welcome relief for the Macintosh fold but not enticing enough for PC users to switch, analysts and users said.

Apple's recent price slashing — between 20% and 29%, depending on model — for the first time put the price of some Macintoshes at or below the price of comparably equipped PCs.

For example, the price of Apple's 200-MHz Performa 6400 dropped from $2,799 to $2,199.

Looking good

One user said the price reductions make Apple products very attractive.

"We are really excited," said Sue Rusiecki, a Macintosh computer manager at Hampshire College in Hadley, Mass., which has more than 500 Macintoshes. "This means that we no longer have to consider price as a barrier for purchasing more Macs."

Another user said the dramatic price drop is turning his attention back to Apple rather than the once-cheaper Macintosh clones.

"We aggressively pursued clones, particularly those from Power Computing, as an alternative and stable supply and because of the cost/benefit ratio," said Mark Stelzner, editorial publishing director at Gruener & Jahr USA Publishing, a New York-based magazine publisher. "But the cost benefits have shifted in Apple's favor on the low end so that, going forward, we are much more likely to use Apple as a supplier of the standard workstations to our editorial department."

The other factor in the decision to move to Apple, according to Stelzner, is Macintosh clone maker Power Computing Corp.'s delays in shipping products.

"Maybe it's dumb luck on Apple's part, but the timing couldn't be better, and Apple may be able to reclaim a lot of users that wandered off in frustration," Stelzner said.

Apple's price reductions on some of its low-end Power Macintoshes were much-needed, said Eric Lewis, an analyst at International Data Corp. in Mountain View, Calif.

"Prices on some of the Power Macs were seriously out of whack compared to PC systems, and the prices needed to come down dramatically," he said.

Small impact

But another analyst said the price cuts will have little impact on increasing Apple's market share.

"It's pie in the sky to think that Apple will explode in market share because of these price cuts," said Tom Rhinelander, an analyst at Forrester Research, Inc. in Cambridge, Mass. "Price is not really the issue. Price cuts will not affect anyone who was not considering a Mac OS system. It will only impact those that already wanted a Mac and watch to get the best prices."

Connie Dillard, microcomputer specialist for the municipal government of San Carlos, Calif., agreed.

"Price has never really been the issue for us," said Dillard, who noted that she was a big fan of the Macintosh. "The issue for us is to standardize on one platform that is easy to support and fits our requirements for working with other government agencies — that is the PC."

Break out the hatchet

Apple has slashed prices to compete with clones and PCs

Company	Apple	Power Computing	Compaq
Model	Performa 6400	PowerBase/200	Deskpro 6000 Model 5200
Chip	200-MHz PowerPC 603E	200-MHz PowerPC 603E	200-MHz Pentium
Hard drive	2.4G bytes	1.2G bytes	1.08G bytes
RAM	16M bytes	16M bytes	32M bytes
CD-ROM	8x	8x	8x
Price	$2,100	$1,795	$2,865

Apple unveils new Newton and portable computer. See page 41.

Internet Society wrestles with domain name expansion

By Gary H. Anthes

The Internet Society in Reston, Va., last week said it had formed a group to consider expanding the number of companies that register Internet addresses and greatly increasing the number of high-order domain names of the type .com and .org.

The society voted in June to accept a proposal to expand the number of registries and domain names, but the idea met considerable opposition. The society has since put the brakes on and is opting to go the committee route — which may kill the idea.

Improving service

The intent is to bring users better service and lower prices by expanding the number of "name registries" from the only provider, Network Solutions, Inc. in Herndon, Va.

Under government contract, Network Solutions assigns names, such as acme.com, and charges $50 per year for their use.

Another intent is to relieve congestion in the .com domain and to help resolve disputes over domain names should, for example, Acme Book Co. and Acme Computer Co. vie for the name acme.com.

"Ten million businesses in North America will be connected to the Internet within the next three years, and there's a dearth of names out there," said William L. Schrader, chairman and CEO of PSInet, an Internet service provider in Herndon, Va.

But some users said the idea of expanding the list of "international top-level domain names" from five to as many as 150 names is flawed.

"The problem is not that we don't have enough domain names," said Ken Crutchfield, a staff consultant at The Dun & Bradstreet Corp. in Parsippany, N.J. "What we really need is a clear, simple directory service that gets you to the company, product or page you want."

A directory service would let users enter, for example, "Acme Book" and get routed via the directory service to the right address. Entering just "Acme" would produce a list of companies with that name.

Crutchfield and others said they worried that expanding the high-level domain name space will equally expand the problems that exist now at the second level — for example, at the "acme" level in acme.com. He pointed out that when toll-free 888 telephone numbers became available, companies rushed to get the same seven-digit numbers they already had in the 800 system.

"It was just an increased cost of doing business," he said.

The domain name space "is getting congested and doesn't offer the flexibility people want," countered Donald Heath, president of the Internet Society. But he acknowledged that the idea of expanding the Internet addressing scheme is controversial and added that the idea may not pan out.

"We may look at this and say, 'Hey, it's not a good idea, and we are not going to proceed with it,'" Heath said.

The group, dubbed simply the International Ad Hoc Committee, will consist of representatives from the International Telecommunication Union, the World Intellectual Property Organization, the International Trademark Association, the Internet Society, the Internet Architecture Board and the Internet Assigned Numbers Authority. Members are expected to be named this week, according to Heath.

Internet Society President Donald Heath: *The domain name space 'is getting congested and doesn't offer the flexibility people want'*

For more info

Information about the proposed changes to Internet domain naming can be obtained from the Internet Assigned Numbers Authority at www.isi.edu/div7/iana. Legal guidelines and information about Internet issues, including the use of domain names, can be found at www.patents.com.

Critics say most companies' Web site designs don't lure new business. See page 61.

Outsourcing, Windows NT top IT to-do list

By April Jacobs

Preliminary results from a new study confirm that the "mind share," or buying intentions, for Microsoft Corp.'s Windows NT is expanding among corporate information technology managers. The IT executives are also calling upon outsourcers to provide broader skills in managing desktops and complex networks.

"Money is ancillary to getting the job done," said Priscilla Tate, executive director of the Technology Managers Forum, which conducted the study of 170 IT professionals in conjunction with International Data Group, the parent company of *Computerworld*. Among the initial findings are the following:

- Although only 20% of the companies surveyed have implemented NT, a whopping 80% of them plan to install it somewhere in their organizations within the next 18 months. Yet those shops with heavy investments in Novell, Inc.'s NetWare are more likely to mix in NT and work with both environments.

Stat to Note
The average number of network users per network staffer is set, according to the preliminary results of a study done by the Technology Managers Forum.

"How much pain is it worth?" asked one information systems vice president at a large New York financial institution. "NT is where everything is moving. But at a certain number of nodes, you get past the point where it's realistic" to migrate users and retrain support staff for a different operating system, he said.

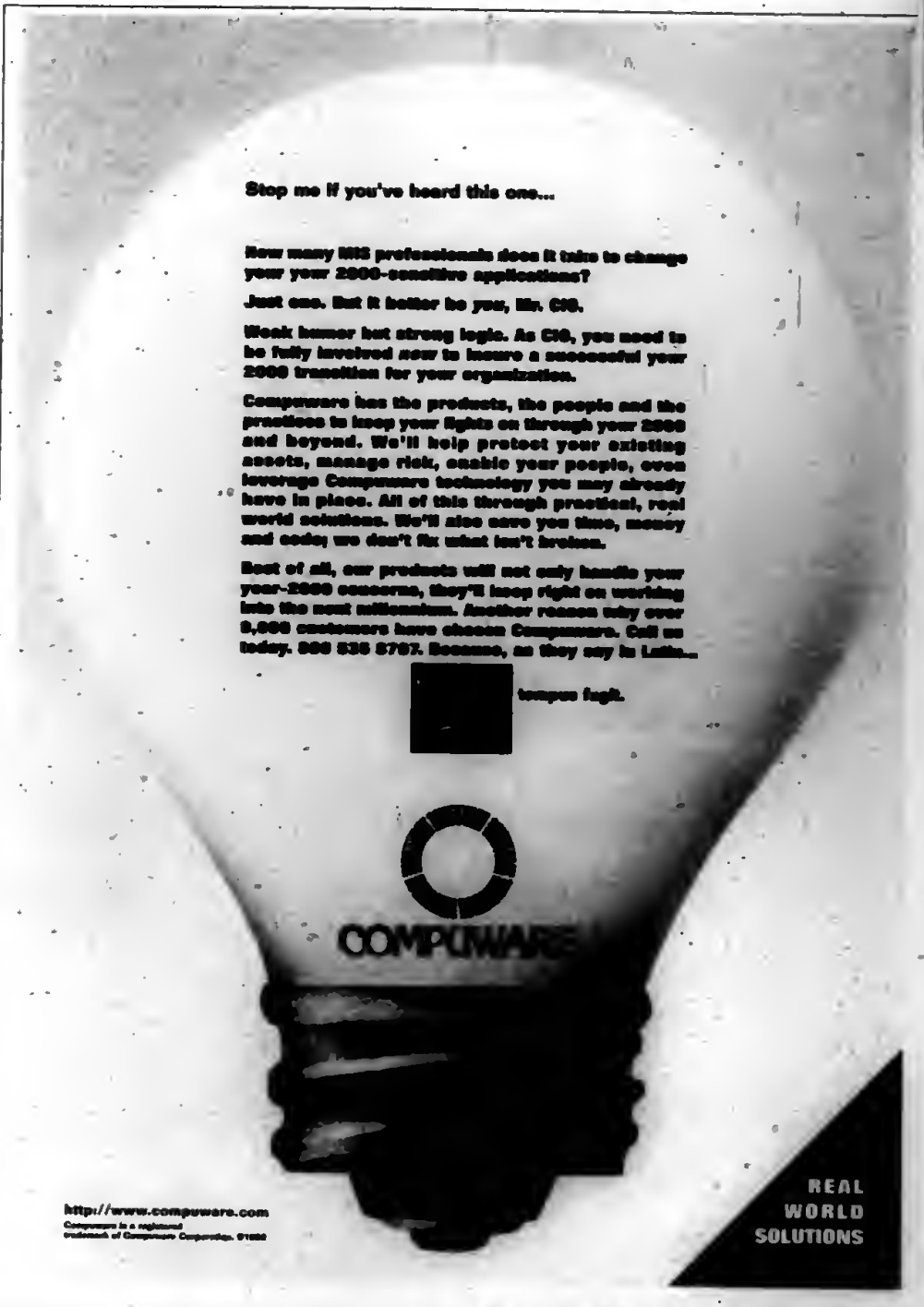
- Companies are supporting more users in remote locations. Among those surveyed, the average network had 6,800 nodes and covered 64 remote locations.
- To get more use from their outsourcers, users are demanding more technical expertise of this temporary help, especially in dealing with desktop support. The maintenance tasks being asked of desktop outsourcers, for example, are moving beyond simple hardware fixes and into memory management and other software areas.
- On average, the companies surveyed spend $180,000 on intranet site development and $300,000 on Internet site development annually — despite a conviction that business benefits are still elusive. More than 80% said they believed their networks are instrumental in giving their companies competitive advantage.

John Osterman, director of networking technology at BankBoston Corp. in Boston, said his firm, with more than 10,000 desktops, is trying to watch the bottom line by standardizing hardware and software and limiting its number of service providers. The bank's global network covers 24 countries.

"If I buy from one [vendor], I have much more leverage to negotiate," Osterman said. BankBoston also buys only Compaq Computer Corp. servers and acquires most of its desktops from Digital Equipment Corp. "Having an architecture and standard configurations drive costs down," he said.

Gary George, director of corporate applications at Liberty Mutual Group in Boston, said his company probably won't migrate to Windows NT because it already has s huge investment in NetWare.

"We'll use NT servers for mail but NetWare for everything else," he said, noting that cost issues played heavily in that decision.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Merger

CONTINUED FROM PAGE 1

the past six months. Cabletron Systems, Inc. has shelled out more than $300 million in the same six-month period to buy three companies. 3Com Corp., which is working on its 14th acquisition in four years, will spend $315 million on two firms this year. Bay will have spent roughly $210 million on three firms in the past six months.

The vendors defend their diversification efforts — mostly in the wide-area network equipment and

remote access markets — by promising one-stop shopping, but users aren't buying it.

"IBM tried that, and it failed. Cisco is trying it now and probably won't be successful," said Jerry Wetherington, systems coordinator and networking specialist at the University of Florida in Gainesville. "These companies become so large and preoccupied with acquisitions that you can't get questions answered in a timely manner, products delivered on time and new technologies like [Asynchronous Transfer Mode] pushed ahead at the same pace."

"The really scary part is that the mergers seem to happen only after users have committed to certain vendors," said Bob Moscowitz, a technical support specialist at Chrysler Corp. in Centerline, Mich. "You don't find out until later if you won or lost."

Moscowitz defines losing as when a key provider is bought by a rival of your other key vendor. "You can expect pressure from management to reevaluate earlier decisions and maybe take action. Dealing with change in this scenario causes problems," he said.

Moscowitz defines winning as being lucky enough to have one of your key vendors swallow up your other key supplier. Chrysler saw two of its key players — SynOptics Communications, Inc. and Wellfleet Communications, Inc. — merge to form Bay Networks, Inc. The result was a single point of cootact for hubs and routers.

Shakeout rumors

Competition is another issue. "We are extremely worried about the lessening of competition brought on by constant mergers and acquisitions," Wetherington said.

Even more unsettling to users is a looming market shakeout, analysts said. For example, *Computerworld* learned last week that Madge Networks, Inc. plans worldwide layoffs after a global restructuring. Also last week, UB Networks, Inc. confirmed rumors that parent company Tandem Computers, Inc. may sell UB. And Plaintree Systems, Inc. reported a $2 million net loss for its quarter ended Sept. 30.

"The shakeout will hit LAN switch vendors of all sizes," predicted Eric Hindin, an analyst at The Yankee Group in Boston. "Not only will billion-dollar-club vendors disappoint Wall Street by not meeting expectations, but one or more could report a quarterly loss in 1997."

Other fallout issues concern product phaseouts or dumpings that occur after two companies with overlapping product lines become one.

This happened last year with 3Com after it bought Chipcom Corp. and phased out the Galactica Ethernet switch.

Users skeptical of LAN switch vendors' attempts to buy into WAN gear markets. See page 53.

Tools carry client/server apps to World Wide Web

By Sharon Gaudin and Frank Hayes

Oracle Corp. and Powersoft Corp. are getting into the moving business — moving client/server applications to the World Wide Web.

The software giants next week will separately unveil products that can port clieot/server applications to a server so they can be accessed from a Web browser.

Users and analysts said the products will save developers a lot of time in their rush to put applicatioos on the Web.

Simpler process

Oracle, in Redwood Shores, Calif., will announce Developer 2000 for the Web at Sun Microsystems, Inc.'s network computer unveiling in New York (see related story, page 8).

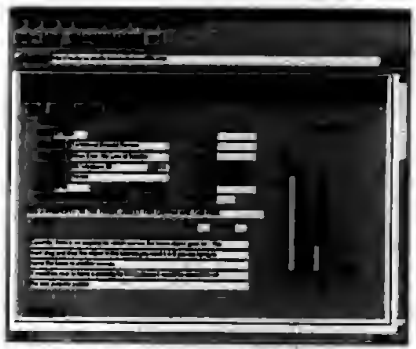
Powersoft, a subsidiary of Sybase, Inc., will release its Internet Developer Tool Kit for PowerBuilder at the Software Development '96 Conference in Washington.

"Giving access to the ioformation from a browser simplifies things dramatically for us," said Micbael Prince, chief information officer at Burlington Coat Factory Warehouse Corp. in Burlington, N.J. Prince uses Oracle's Developer 2000 first for in-house applications and then for Internet access.

But sometimes the tricky part is moving those applications to a browser-accessed server.

Without porting tools, moving the application would require a time-consuming programming effort and may mean having to learn a new language, such as Java.

"With these products, you don't have to learn a new language. That's going to save people a lot of time," said Evan Quinn, an analyst at International Data Corp. in Framingham, Mass.



Oracle's Developer 2000 for the Web *was designed to move applications from the Windows desktop to the server*

Powersoft's tool kit has the following key features:

- A PowerBuilder Window Plug-In that lets developers move applications to the Web.
- A Data Window Plug-In to access reports on the server from a browser.
- Two class libraries, one to handle data management and one to build custom Hypertext Markup Language forms.
- A Personal Web Server packaged in the box so users can start developing as soon as the software is installed.

"It's a full-shopping-cart applicatioo," said Cecil Craft, president of Craft Enterprises, Inc. in Irving, Texas, which sells National Football League (NFL) merchandise on the Web.

"I took PowerBuilder for the Web and built my applicatioo for the NFL catalog in between 200 and 300 hours. Considering the alternative of doing it in Java or C++, that [development time] is pretty trivial," he said.

Slimmer clients

Oracle's Developer 2000 was designed to move applications off the Windows desktop to the server.

It also includes a Developer 2000 software server that will sit on the middleware server, which allows the Web browser to run applications.

"It's a dynamite product," Prince said. He said Oracle's Developer 2000 lets him significantly slim down his fat clients, which allows the applications to run faster.

Quinn warned that both products are just intermediary steps because they offer only emulation of applications.

"They don't provide any strategic leap of technology. Neither company will be able to rest on these laurels for too long," he said.

Transfer of ownership makes D&B users wary

By Randy Westoo

Customers of Dun & Bradstreet Software are keeping a wary eye on the company's new owner, wondering if Geac Computer Corp. can manage such a large purchase. The Markham, Ontario, firm said it will buy D&B Software in Atlanta for $150 million.

Dick Hudson, chief information officer at Global Marine, Inc., an offshore drilling company that uses D&B Software's SmartStream business applications, said he will wait and see. "I don't know anything about [Geac] or its practices, not that I have much of a choice since I'm tied to Dun and Bradstreet products," he said.

Hudsoo said be hopes Geac "lets Dun and Bradstreet concentrate on their core business, whicb is applications, and supports the marketing and research divisions so the company can remain a major player."

Business as usual

D&B Software and Geac are telling users it will be business as usual if the acquisition is approved early next month. For example, D&B Software pledges a rollout early next year of SmartStream for Microsoft Corp.'s SQL Server 6.

Analysts have said they aren't sure if Geac, a company with $230 million in sales last year, can handle a company as large as $350 million D&B Software. Most of Geac's purchases have been of small niche-market companies such as Pro-Mation, Inc., a $3 million Salt Lake City-based maker of project management software for construction companies.

Geac is a "loose-knit conglomerate of software portfolios," said Barry Wilderman, an analyst at Meta Group, Inc. in Stamford, Conn. He said D&B Software will represent about half of Geac's holdings and its success will depend on the management team that is put in place at D&B Software.

Wilderman pointed to Sterling Software, Inc. and Computer Associates International, Inc. as examples of firms that have pulled off such arrangements.

"They need to consolidate some of their product lines and take advantage of their strengths like work flow," Wilderman said.

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Monorail tracks into low-cost PC market

By Stewart Deck

Quick, what's the first thing that comes to mind when someone says "monorail"?

Most people think of Disney World, but a new company hopes to change that.

Monorail, Inc. in Marietta, Ga., today will unveil a full-featured PC that it hopes will supplant, or at least share space with, Mickey Mouse and the Magic Kingdom in the public consciousness.

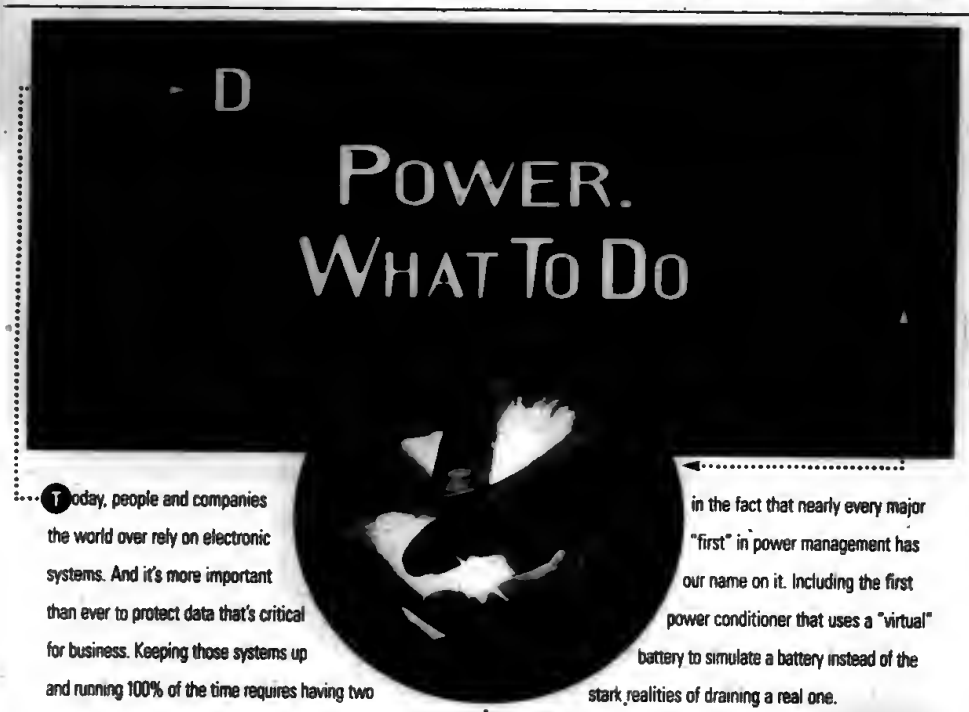
"The market for low-priced PCs has not been exploited. With a decent machine, they could really do well," said Dean McCarron, an analyst at Mercury Research in Scottsdale, Ariz.

Rob Enderle, an industry analyst at Giga Information Group in Santa Clara, Calif., said Monorail had anticipated the market well. "This PC will be a great telephony solution for receptionists and a better answer than a network computer for a company that needs a PC connected to a network," he said.

> **"The market for low-priced PCs has not been exploited. With a decent machine, they could really do well."**
>
> *—Dean McCarron, analyst, Mercury Research*

Enderle and McCarron said any new PC manufacturer faces some major hurdles because of very tight margins and fierce competition from well-established companies. However, Enderle said, Monorail's management team includes several savvy former Compaq Computer Corp. executives who seem to know what they are getting themselves into.

The Monorail PC will have a 75-MHz Advanced Micro Devices, Inc. processor, a 1G-byte hard disk drive, 16M bytes of memory, a four-speed CD-ROM drive, built-in stereo speakers, a 10.4-in., dual-scan flat-panel monitor, Windows 95 and online service software. It all comes in a sealed case for less than $1,000 and will be available by Thanksgiving.



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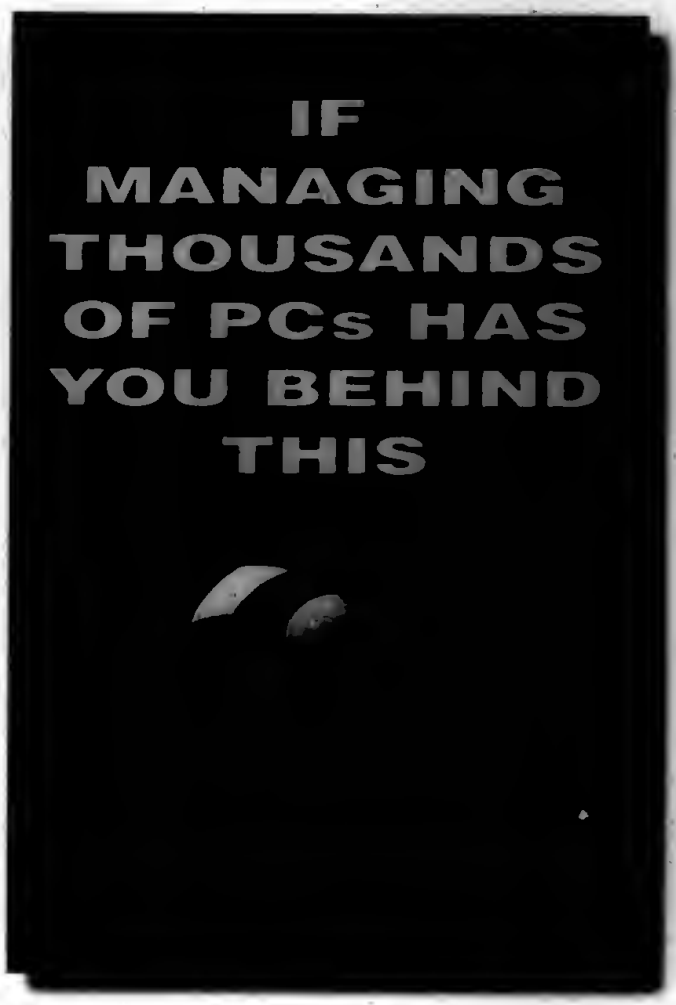

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3Com offers firewall as free software upgrade

By Bob Wallace

Picking a security package for LAN internetworks has become more complicated since 3Com Corp announced a limited firewall strategy for its NetBuilder routers.

Internetworking vendors such as Cisco Systems, Inc and Bay Networks, Inc. have tried to address mounting user concerns about network security. But analysts said most vendors' firewall strategies are incomplete.

Under 3Com's plan, users need only a free software upgrade to add firewall capabilities to NetBuilder routers. But conspicuous in its absence was a stand-alone workstation-based system needed to provide more robust security features.

"Router-based approaches provide basic firewall capabilities. The best strategy is to combine that with a stand-alone system that provides a more menacing and powerful barrier to the resources you want to safeguard," said Tom Nolle, president of CIMI Corp., a Voorhees, N.J., consultancy.

> "What's happening is that the industry is lumping all firewalls into one category, where, in fact, there are huge differences in sophistication. That makes it tougher for users to decide what they need or don't need."
>
> *— Tom Nolle, president, CIMI Corp.*

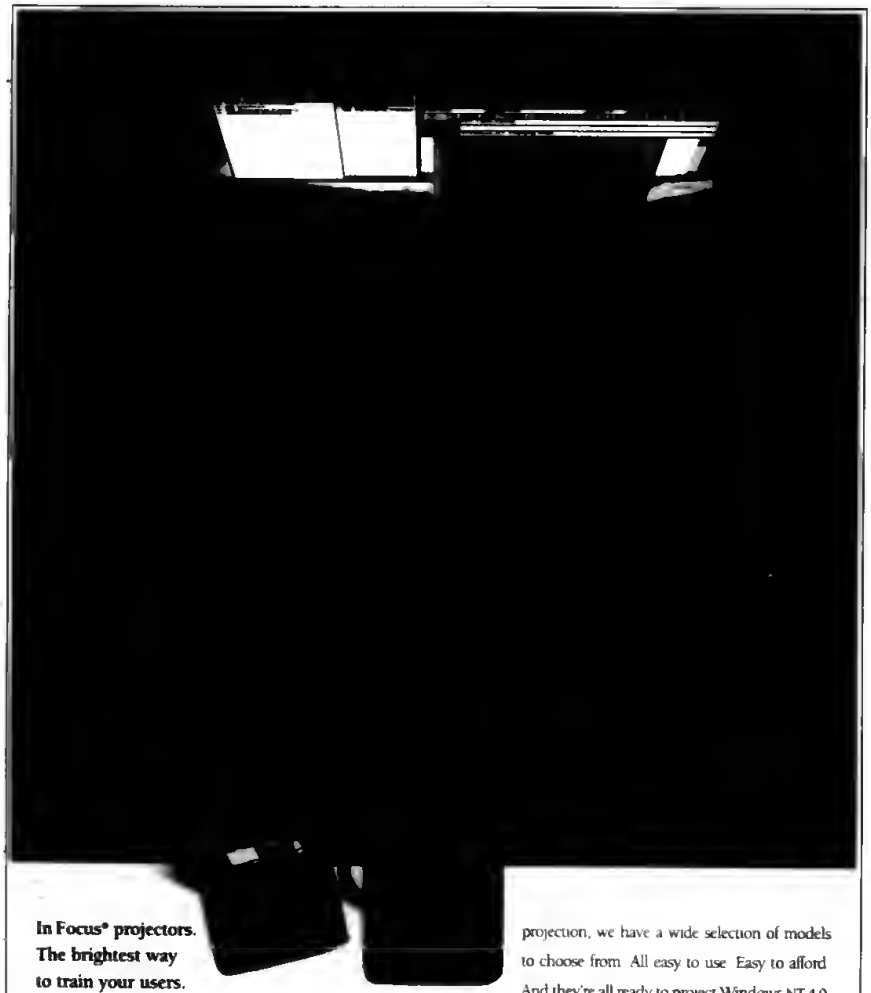
One early user said he is pleased with 3Com's router approach to firewalls. "The capabilities work well, and it's very easy to set up filter tables and logs for the routers," said Dax Lee, a network manager at GolfWeb, Inc., a Cupertino, Calif., provider of World Wide Web-based golf resources.

"The combination approach would be useful, as it would provide two layers of security, but would be best for users with larger networks," Lee said.

Users face many challenges in making their LAN internetworks secure.

"What's happening is that the industry is lumping all firewalls into one category, where, in fact, there are huge differences in sophistication," Nolle said. "That makes it tougher for users to decide what products they need or don't need."

There are vast differences in price. For example, 3Com's approach is a free software upgrade, but buying a stand-alone system for a central site costs users anywhere from $3,000 to much more than $20,000.



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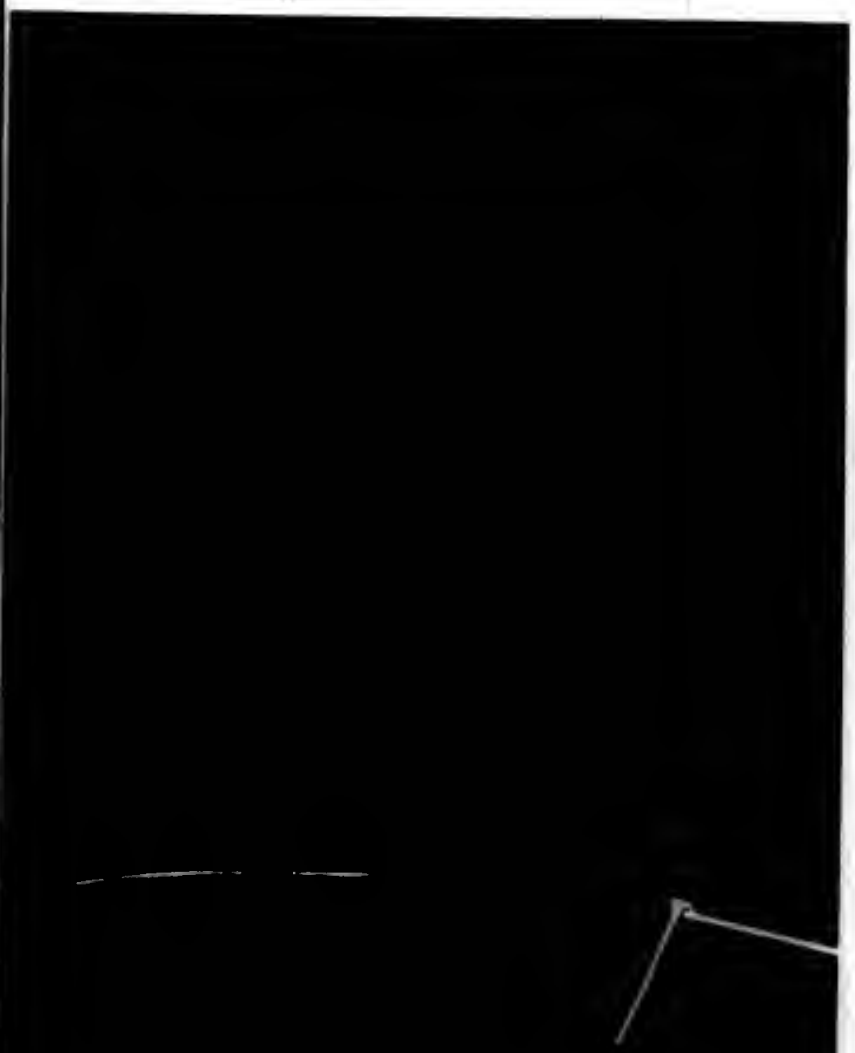

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Computer Industry

Third-quarter financial report card

	Revenue	Percentage change from Q3 1995	Income	Percentage change from Q3 1995
Baan Co.	$97.7M	80%	$9.3M	300%

Officials at the enterprise software maker said margins increased during the quarter and that a major deal was signed with Sun Microsystems to enhance JavaSoft.

Microsoft Corp.	$2.3B	14%	$614M	23%

Microsoft credited its diverse product mix for its continued solid growth. Sales of Windows NT were particularly strong. Factoring out the Windows 95 sales blip of last year, Microsoft's year-over-year revenue would have been up 30%.

Netscape Communications Corp.	$100M	329%	$7.7M	3,750%

Netscape credited its growth not to its popular Navigator browser, but to penetrating the global corporate intranet market. Netscape spun off its consumer software products division so it could focus on corporate sales.

PeopleSoft, Inc.	$115.6M	92%	$14.8M	100%

Demand for PeopleSoft's client/server software remained strong. The company bought Red Pepper Software, a provider of manufacturing and supply-chain management software.

Unisys Corp.	$1.63B	9%	$14.2M	NM

Unisys continued its transition from a mainframe company to a service provider and reported that 63% of its revenue came from service. Company officials also said that its ClearPath line of enterprise servers was doing well but that product delays will cause ClearPath sales to fall short of earlier estimates.

NM=Not meaningful

DEC hits the deck

$66M loss raises concerns about fundamental weaknesses

By Jaikumar Vijayan

Digital Equipment Corp.'s disastrous quarterly results have prompted some analysts to ask whether the company is becoming a marginal player.

Digital last week announced a loss of $66 million on revenue of $2.91 billion. That was its lowest quarterly revenue since 1987, and analysts said it underscores the trouble Digital is in.

The weak earnings also put increasing pressure on CEO Robert Palmer, who until recently was hailed for pulling Digital out of a similar situation two years ago.

"Warranted or otherwise, Digital isn't too far from getting a death-spiral kind of image," warned Terry Shannon, editor of "Shannon Knows DEC," a newsletter in Ashland, Mass.

For the short term, at least, Wall Street "has taken a skeptical outlook, partly because we can't isolate how much of Digital's problems are transitionary and how much of it is of a more fundamental nature," said Michael Geran, an analyst at a division of Donaldson, Lufkin & Jenrette Securities Corp. in Jersey City, N.J.

CEO Robert Palmer *Are his days numbered?*

Losing mind share

The growing skepticism caused by Digital's financial woes could seriously hurt the company's credibility as a major industry player, observers warned.

For instance, in a recent *Computerworld* mind share survey that measured which company information systems managers consider to be their primary supplier, Digital trailed well behind market leaders, including IBM, Hewlett-Packard Co. and Sun Microsystems, Inc.

In fact, respondents ranked Digital seventh in PCs, sixth in workstations and fourth in both the server and World Wide Web server markets.

Digital executives last week blamed the latest slowdown on a recent sales force reorganization aimed at boosting direct account coverage. Digital had previously cut back drastically on the direct sales force.

Fiscal quarter	Revenue	Profit/ loss
Q1 1996	$3.27B	$48M
Q2 1997	$2.91B	-$66M

Analysts also pointed to potentially larger problems down the road for Digital. Those include an ominous slowdown in Alpha server sales, a continuing weakness in Europe and a money-losing PC business.

"Digital is wallowing in opprobrium today," but the fact remains that Palmer has done the comeback-kid gig once before. There is no reason why he can't do it again," Shannon said.

Big iron leasing slows IBM down

By Craig Stedman

Mainframe shipments are booming, but IBM's financial results aren't booming along with them.

Although that is partly because of continued price erosion, it also is fueled by a growing tendency among users to lease rather than buy big iron.

Susan Middleton, an analyst at International Data Corp. in Framingham, Mass., said nearly half the air-cooled mainframes being installed by IBM are leased rather than bought. "That's definitely higher than in the old days," when fewer of its water-cooled machines were leased, she added.

IBM's third-quarter numbers came in slightly ahead of Wall Street expectations last week (see chart). But some financial analysts cut their earnings forecasts for the fourth quarter because of several cautionary factors cited by IBM executives, including the trend toward leasing. As a result, analysts said they expect IBM's fourth-quarter results to be good but not superlative.

Leasing cuts into the up-front revenue that IBM gets on mainframe sales because payments are typically spread out over three years. With leasing on the rise, IBM isn't seeing the full benefit of an expected 25% jump in its installed base of mainframe MIPS this year, Chief Financial Officer Richard Thoman said.

Thomas Loane, vice president of computer and communications services at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla., said leasing is becoming especially appealing as IBM's new air-cooled mainframes start replacing the water-cooled boxes of yore.

The new microprocessor-based System/390s are being upgraded every year, which makes product life cycles too short to justify an outright purchase, Loane said. "A lot of people aren't ready emotionally for the thought of buying something for $5 million and having it be worth nothing in three years," he said.

Also, IBM Credit Corp. offers aggressive leasing rates and terms to customers who want air-cooled mainframes, Loane added. Alamo recently signed three-year lease deals on two of IBM's brand-new Enterprise Server G3 systems that will let it upgrade to future models without paying price or interest penalties, he said.

The book on IBM

	Q3 1995	Q3 1996	Percentage change
Revenue	$16.75B	$18.06B	7.8%
Income	$1.38*	$1.29B	-1.3%

*From operations. IBM reported a net loss of $538 million because of a one-time charge of $1.84 billion related to its purchase of Lotus Development Corp.

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CEO Robert Palmer: *Are his days numbered?*

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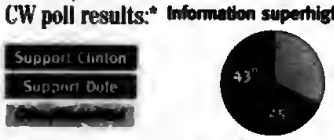
Technology in Government

Clinton promises: Fund basic research in networking technologies. Modernize and streamline telecommunications regulations. Connect all classrooms, libraries and hospitals to the Internet by 2000.

Dole promises: Encourage businesses to provide computer equipment, training and maintenance support to schools.

CW poll results:* **Information superhighway**



"Clinton and Gore appear more forward-thinking and capable of understanding the technology. Especially with Gore; I definitely get the impression he is interested in technology, and I don't get that impression with Kemp."

– **Lee Nienaber,** IS manager, Calvert Group

"The Internet is just an explosive issue, it's going to change our lives, and Clinton seems to get that more."

– **Brenda Angle,** systems engineer, A. Louis Supply Co.

Encryption Policy

Clinton promises: Loosen controls on the export of encryption products, but retain the requirement that encryption keys be made available to law enforcement.

Dole promises: Support legislation to allow the export of any encryption product, without a "key-recovery" scheme – if a comparable product is already available overseas.

CW poll results:* **Encryption policy**

"The Republican Congress and Dole have been very good on the encryption issue and have been very supportive of the industry."

– **Ken Kay,** executive director, Computer Systems Policy Project

"We're losing business to European and South African and Japanese companies because of [the key-escrow requirement]. A bank in Germany doesn't want to hear about what the U.S. government has to say [about which products it can or can't buy]."

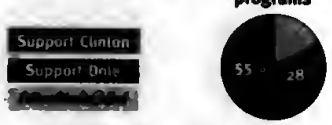
– **Marc Andreessen,** vice president of technology, Netscape Communications Corp.

Research & Development Policy

Clinton: Boost federal funding for research in health care, the environment, information technology and national security. Maintain or strengthen existing federal R&D programs. Support a permanent R&D tax credit.

Dole: Stimulate private-sector investment in R&D via tax cuts, tax incentives and regulatory reform. Eliminate Clinton programs that fund product development.

CW poll results:* **Government technology programs**



"There are alarming cuts in the R&D budget [plans] in the out years. In fact, the president's budget is more draconian than the Republican plan."

– **Arvid Larson,** chairman of the R&D task force, American Association of Engineering Societies

"The Dole budget plan is vampire economics because it sucks the lifeblood from our nation's future by devastating our science and technology efforts."

– **Rep. George Brown** (D-Calif.)

* Base: 100 IS professionals

Bid to streamline government

By Gary H. Anthes

The Clintoo administration hasn't quite "reinvented" government yet, but observers said it is making headway.

"Overall progress of the National Performance Review has been pretty good," said Donald Kettl, director of the Robert La Follette Institute of Public Affairs at the University of Wisconsin in Madison.

Inaugurated three years ago, the National Performance Review (www.npr.gov) was designed to streamline the federal bureaucracy and improve public services. Technology was to play a key role. The program called for wide deployment of networks, online databases and citizen-accessible applications intended to create an "electronic government."

In a recent report to President Clinton, Vice President Al Gore claimed that by the end of 1999 the program will have cut the federal workforce by 273,000 people, trimmed regulations by 16,000 pages and saved taxpayers $118 billion.

As of Sept. 1, improved information technology and other initiatives already had saved $73 billion out of the expected $118 billion and eliminated 240,000 positions, he said.

And in a recent report, the General Accounting Office said that of 1,203 "action items" in the

Vice President Al Gore *waves to a crowd in Birmingham, Ala., this month, where he was promoting the Family and Medical Leave Act*

IS voters favor Dole

CONTINUED FROM PAGE 1

Observers singled out Vice President Al Gore for the strides he has made in the mammoth "reinventing government" program (see story above).

Despite these gains, Clinton has lost ground in Silicon Valley since 1992 because of his unpopular stand on encryption and weak opposition to abusive shareholder lawsuits.

"I'd say that Clinton is perceived as being no friend of high tech at this point," said Rob Enderle, an analyst at Gartner Group, Inc. in San Jose, Calif.

"By and large, the Clinton administratioo has done a marvelous job," said Ken Wasch, president of the Software Publishers Association in Washington. He said the Clinton administration works with the software industry far more closely than did the Bush or Reagan administrations.

But even Clinton supporters are quick to oote where the White House has fallen short on matters important to the high-tech industry. Often cited is the administratioo's stand on the unrestricted export of strong encryption prod-

Photos: Associated Press

Republican candidate Bob Dole *greets the crowd at a campaign rally in Morristown, N.J., early this month*

praised

original September 1993 National Performance Review report, 380 had been completed as of January this year.

Especially noteworthy, according to Charles Brownstein, executive director of the Cross-Industry Working Team, a coalition of large users and vendors of information technology in Reston, Va., have been the overhaul of information technology procurement regulations and the establishment of electronic services, such as online databases, public bulletin boards and toll-free telephone numbers.

Warren Suss, a government technology consultant and president of Warren Suss Associates in Jenkintown, Pa., hailed progress in developing a nationwide electronic benefits transfer system that will pay out $110 billion in food stamps and other benefits by 1999.

Other accomplishments cited in the vice president's report include the following:

- Two-hundred and fifty technology-driven "reinvention labs." For example, the General Services Administration established the first electronic shopping mall for federal customers, which cut the cost of real estate sales by 50% while generating revenue of $73 million.
- An interactive service at the Social Security Administration via which citizens can retrieve personal benefits estimates.
- An electronic Federal Information Center and an electronic bulletin board to offer integrated, governmentwide data.

But even those who praised the National Performance Review cited some failings.

Suss said the program has had limited success so far in its attempts to link information systems investments to measurable benefits. "But that's a tricky proposition, and the private sector has not solved it any better than the public sector," he said.

ucts, which it continues to oppose despite several compromises.

"The Clinton administration ... is on the wrong side of the issue," said Marc Andreessen, vice president of technology at Netscape Communications Corp. in Mountain View, Calif. Netscape endorsed Dole as a result, he said.

But recently, the White House took a major conciliatory step when it said it would allow, for two years, the export of strong encryption without the unpopular key-escrow feature [CW, Oct. 7].

Legal reform

Industry executives complain most bitterly about Clinton's veto of a bill that would have curbed the frivolous shareholder lawsuits that have especially plagued Silicon Valley.

Dole led an effort in the Senate that overrode Clinton's veto. And in a turnabout some find puzzling, Clinton has joined Dole in opposing a California ballot proposition that would make it easier to sue a company for alleged securities law violations.

Much of the praise Clinton has received is actually directed toward the vice president. Despite an overall preference for Dole, IS professionals polled by *Computerworld* said they preferred Gore to vice presidential candidate Jack Kemp by a margin of 29%.

"Al Gore's placing the information superhighway on this country's agenda was government at its best," said Michael Maibach, vice president of government affairs at Intel Corp. "It was the government saying, 'We are not going to run this thing, regulate it or tax it, but we ought to pay a lot of attention to it.'"

Ken Kay, executive director at the Computer Systems Policy Project, a coalition of 13 computer company CEOs, said the administration hasn't been as deficit-conscious as it should have been and hasn't worked as closely with industry as it should have in developing research and development policies and programs.

Although Democrats — including Clinton and Gore — tend to be more supportive of government technology programs, the industry complains this administration hasn't done enough to sponsor and fund basic research.

Republicans in Congress reduced funding for programs such as the Commerce Department's Advanced Technology Program, which provides matching grants to industry for basic research, "but the administration has not gone to bat for them very strongly, either," said Arvid Larson, chairman of the research and development task force at the American Association of Engineering Societies in Washington.

Senior editor Kim S. Nash contributed to this report.

President Clinton *reaches out to touch a baby during a campaign stop in Wyandotte, Mich., in August*

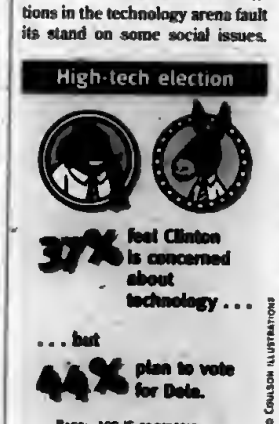
Clinton has techie edge, but other issues override

By Mindy Blodgett and Gary H. Anthes

Information technology professionals believe Bill Clinton is the techie candidate, but it is other issues that have them voting for Bob Dole.

A recent *Computerworld* poll of IS professionals showed Dole leading Clinton by 13 percentage points. Respondents said personal philosophy and party affiliation were more important than whether the candidate is sympathetic to technology issues.

For example, some users who endorse the administration's actions in the technology arena fault its stand on some social issues.


High-tech election
37% feel Clinton is concerned about technology . . .
. . . but
44% plan to vote for Dole.
BASE: 100 IS PROFESSIONALS
Source: Exclusive Computerworld survey

DAVID COULSON ILLUSTRATIONS

Essie Williams, a database consultant at Business Information Systems, Inc. in Pittsburgh, expressed concern about some of the administration's actions concerning privacy. He faulted its encryption policies and the antiterrorism act the president recently signed allowing airlines to keep vast databases of information on travelers.

Character issue

Character is an important issue for J. T. Mitchell, a senior vice president at Power Conversion Products, Inc. in Crystal Lake, Ill. He said that as a lifelong Republican, he will vote for Dole. "I don't care much for Mr. Clinton," he said. "I just don't think he has any character at all."

But the character issue and social concerns can cut both ways.

"I guess I feel that voting for Clinton and the Democrats is more a vote for idealism and looking forward," said Doug Moran, information systems analyst at CRSS Constructors, Inc. in Boulder, Colo. "I just don't like Dole on social issues."

However, Linda Patent, information systems manager for Caruso International, Inc. in Warminster, Pa., said she is voting for Dole because she sees the need for "new blood, a breath of fresh air."

"Even though [Dole] is older, I feel that no president should be in office for more than four years," Patent said. "I just think the country needs a change."

But despite the wide support for Dole, some IS professionals said they view Clinton as the lesser of two evils. Lee Nienaber, IS manager at Calvert Group in Bethesda, Md., said he is likely to vote for Clinton. "I guess it's a matter of who will be less detrimental," he said.

Clinton also generated some support from his technology-related positions. Williams said one reason he will support Clinton and Al Gore is that they "have been promoting and touting Internet usage in the schools and in education."

Brenda Angle, a systems engineer at A. Louis Supply Co. in Ashtabula, Ohio, agreed that Clinton and Gore give at least the appearance of being more on top of high technology issues.

COMPUTERWORLD

With little more than a week remaining before the presidential election, many high-tech leaders are pushing for Dole and berating Clinton for what they see as a betrayal of their business.

To read this story, and peruse a list of contributors and election-related URLs, please visit:

IS wake-up call

No one is campaigning for the "IS vote." But there are such things as IS issues, and IS management should pay attention to them at election time and after.

Microsoft, Oracle, IBM and other vendors are supporting changes in the Uniform Commercial Code (UCC). Pray they never become law. If these amendments take effect, IS costs and legal liabilities will increase. You'll be spending your time negotiating more contracts and playing 'net cop.

One change sounds like an online version of shrink-wrapped software licenses, only worse. Any mail clerk who downloads software from the Internet, after a contract notice flashes on his screen, would legally bind his company to whatever the contract says. No negotiation, no legal recourse.

The result: Companies will have to check on employees to make sure they aren't "signing" contracts.

But while the vendors look out for themselves, IS has shown little interest. Only the Society for Information Management (SIM) and a few large companies appear to be aware of the danger.

"Vendors are being up-front; it's all on the table. But you don't have to push hard if there is nobody on the other side," says Susan Nycum, an attorney at Baker & McKenzie who watches UCC developments for SIM.

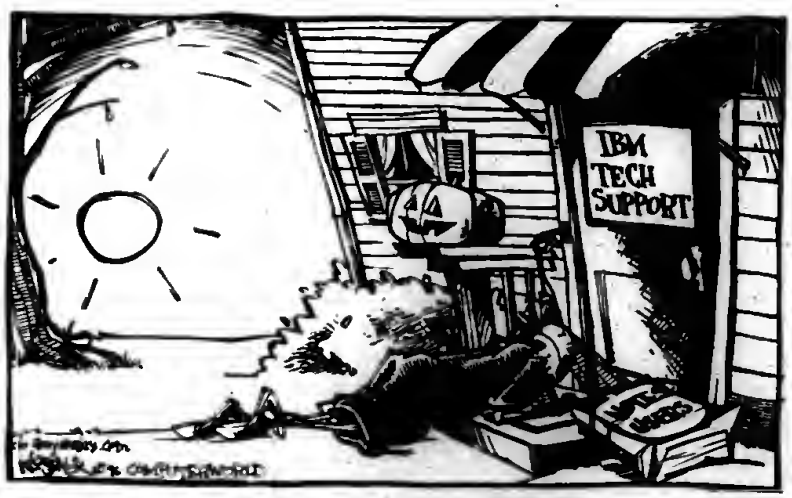
There are other issues. Take deregulation. Do you like increased competition and greater choice? Then wide-open competition in all telecommunications markets is in your best interest. Telecom managers should know which candidates are aggressively pursuing deregulation and which aren't. Ask the candidates via their Web sites: www.dolekemp96.com and www.cg96.org.

Are you a security-minded IS manager in a multinational company? Then you should support less-restrictive export policies on encryption technology. If Uncle Sam opens the door to more exports, IS managers can help their overseas users and ensure interoperability with domestic encryption standards.

IS executives and associations must watch and sound the alarm when their companies' interests are at stake. Otherwise, that great sucking sound might be coming from your budget.

Allan E. Alter

Allan E. Alter, *Senior editor, Managing*
Internet: *allan_alter@cw.com*



It's been the Queen's English for more than 40 years

Save King's English ...

As an editor, I appreciate Kenneth Hobbs' comments on "The King's English, please" [Letters to the editor, CW, Sept. 2]. On the whole, I think *Computerworld* is an effective communication tool, and I rely on it to keep up with the industry.

The only thing I would point out in Mr. Hobbs' letter is the heading you gave it. Unless I am mistaken and Her Majesty Elizabeth II has passed away, your heading should read "The Queen's English, please." Save The King's English for Charles.

Dan DeBello
Loveland, Ill.

...for the moment

No problem getting NT 4.0 in Canada

I'm writing in regard to Mike Neal's letter to the editor ["Foolish thoughts," CW, Aug. 26]. Neal had visited an Egghead Software store and asked when it would have Windows NT 4.0 in stock. He was told Egghead wouldn't get Windows NT 4.0 until October, and the clerk added, "You're a fool to believe anything Microsoft says [about release dates]."

I live in Canada and purchased NT 4.0 Workstation and NT 4.0 Server off the shelf in a small software store during the first week of September. They had lots in stock. I suggest that the problem might be with that Egghead clerk's attitude toward selling Microsoft products.

It certainly has nothing to do with actual release dates and supply.

Vince Mullan
Chevron Canada Resources
Calgary, Alberta

Wisdom of temps

I found the "I am a temp" article [CW, Sept. 16] an exceptionally fine one. It should probably be made available on a recurring basis to every consultant and manager in the world. There are many other "been there, done that, got the T-shirt" professionals scattered throughout the industry whose thoughts would be beneficially published.

Michael G. Jones
Palm Harbor, Fla.
cherev@ibm.net

Attractive option to Intel available

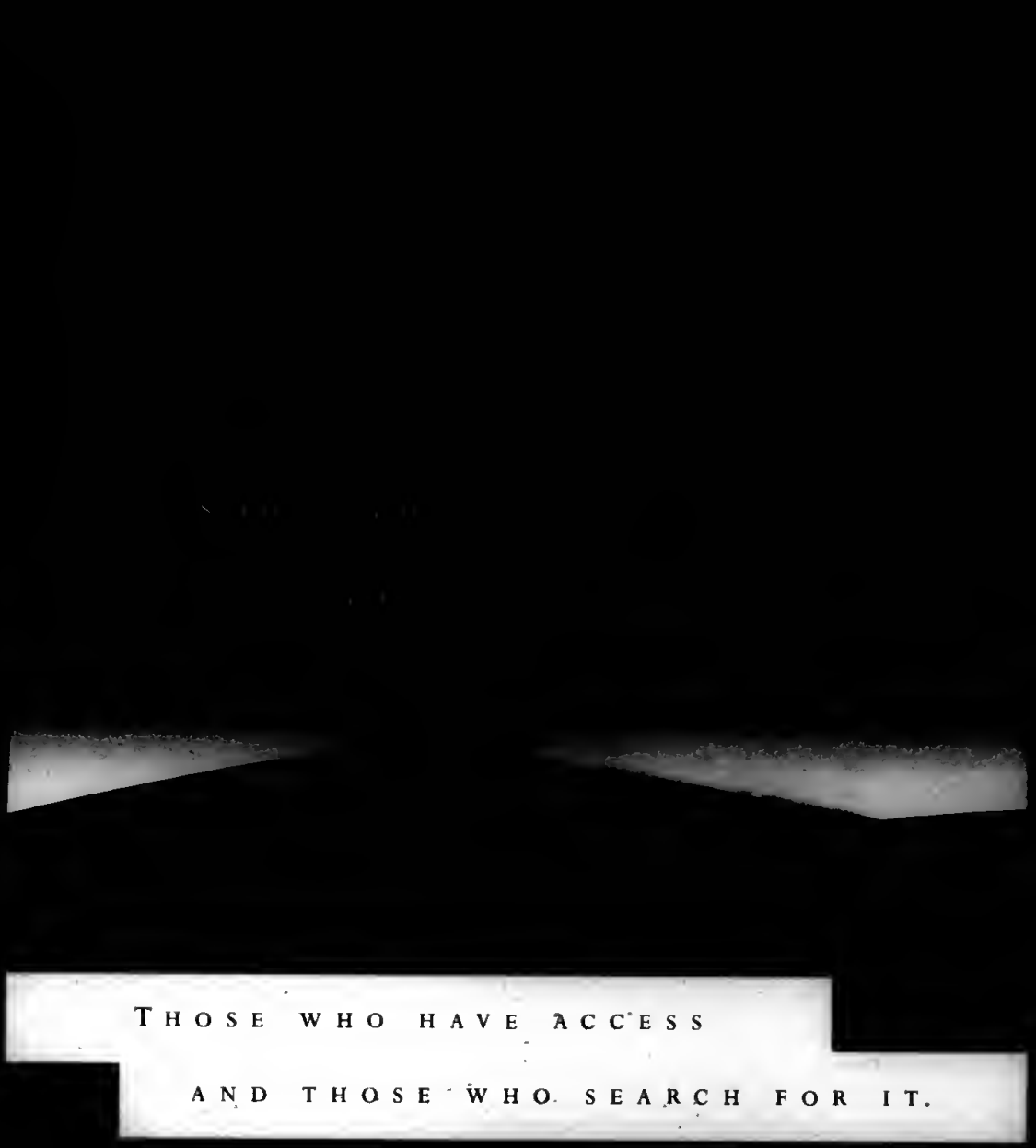
Your article "NT workstations nip at Unix heels" [CW, Aug. 26] had some useful information but painted a black-and-white picture of the workstation world. Most software developers will tell you that the Intel x86 architecture has been a well-beaten dead horse since the 80286.

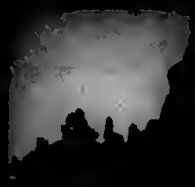
Newbies to the workstation realm who anticipate heavy NT use have a more attractive option than your Intel bias suggests. From the early days of NT, Microsoft has worked feverishly to produce the 64-bit version of Windows, which runs on Digital's Alpha processors. In fact, Alpha-based workstations that run up to 500 MHz can still give PC vendors a run for their money.

I suggest PC buyers consider their alternatives before they return to perpetuating the poor engineering that has plagued the computer industry for nearly 15 years.

J. Aaron Holmes
Pullman, Wash.

■ Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.


THOSE WHO HAVE ACCESS
AND THOSE WHO SEARCH FOR IT.



INTRODUCING DISTRIBUTED

OPEN SYSTEM AND AN OPEN MIND.

distributed

access

ACCESS. THE DIFFERENCE BETWEEN AN

These days, you hear a lot of companies talk about open system computing philosophies, and while Compaq was one of the early pioneers, we believe that it's time to take a big step farther. To an open business philosophy. A philosophy that begins with something we call Distributed Access.

Distributed Access is not a canned solution. It's not a new piece of hardware or software or a sales force. It's an idea literally based in decentralized network computing environments and figuratively based in distributing *access* to the people who need it. It's a new model of computing that offers the control of traditional legacy systems and the added flexibility and freedom to help you connect people to people and people to information.

How can we do that? By taking the time to understand not just your computing needs today, but the direction of your entire company. Knowing where you want to go and how you want to get there. But most of all, by knowing that what's truly important isn't computers or computing, it's information.

Finding it. Shaping it. Protecting it. Distributing it. Across the hall or across the globe. If information is the engine that runs today's successful businesses, Distributed Access is the fuel.

Our goal is to make information flow faster, farther, better. When the information that you need, anywhere in your company, anywhere in the world, is as easy to access as the evening news, we'll consider that a job well done.

And a benchmark to beat.

COMPAQ

WE DON'T CLAIM TO HAVE ALL THE AN

JUST THE PARTNERSHIPS TO FIND

distributed

access

Can one company make an idea like Distributed Access a reality? Yes, if that company doesn't think like one company. If that company jettisons the one-stop shopping, "we can do it all" mentality. If that one company keeps an open mind.

In the world of Distributed Access, an open mind is one that is ready and willing to embrace better ideas, no matter where they come from.

At Compaq, we work with Microsoft, Novell, SAP, EDS, Oracle and Intel every day, day in and day out, to make sure that you not only get best-of-breed solutions, but the right best-of-breed solutions. Solutions like that don't happen by phone or fax or by getting together in Las Vegas for a few days. They happen when people roll up their sleeves and work together.

Which is why we have engineers that actually live in Redmond, Washington, constantly testing and improving the performance of Compaq servers running Windows NT.® Microsoft, on the other hand, tests products like Microsoft Exchange Server® and Microsoft SQL Server® using Compaq servers as their lab.

Our Integration Management solution allows you to integrate Insight Manager with the likes of BMC, Cabletron and Seagate.

Compaq's partnerships with the brightest people in the technology world mean that we see new ideas sooner and, as you might expect, we're able to incorporate them into your business sooner.

The same goes for potential problems. We'll be the first to know and the first to fix the problem. Which means you'll be the last to get burned.

To put it bluntly, when it comes to Distributed Access, partnerships are not considered smart public relations. They are considered the cornerstone of the way we do business.

They keep us one (maybe two) steps ahead of our competition.

And we believe they can do the same for you.

COMPAQ

SWERS,
THEM.

NOW THAT WE'RE
LET'S GET DOWN
ARCTIC OC
PACIFIC OCEAN
NORTH ATLANTIC
ATLANTIC
THE WORLD

ALL HERE,

TO BUSINESS.

Whether they be the plaster partitions of offices, the geographic boundaries of countries or the invisible barriers of time zones, the walls of business are about to come tumbling down thanks to two phenomena known as the Internet and the Intranet.

Through Distributed Access, we intend to not simply help this happen, but to make it happen.

The fact is, Compaq's philosophy—the ongoing establishment of industry standards and development partnerships—perfectly mirrors the foundation upon which the Internet has been based.

distributed @ access

The way we see it, the Internet is not just about reaching out, it's about reaching in. Which is why we've entered into partnerships with the likes of Microsoft, Cisco, BMC Software and Intel to establish Web-based enterprise management tools. Soon, you will be able to manage complex networks using any Web browser. In other words, reducing both the complexity and cost of systems management by using Internet technologies to solve old problems in new and better ways.

Over the years, a lot of people have talked about the coming of the information superhighway. The fact of the matter is, it's not coming, it's here. It's called the Internet.

Distributed Access can make sure you and your business are drivers, not just passengers.

COMPAQ

Has It Changed Your Life Yet?

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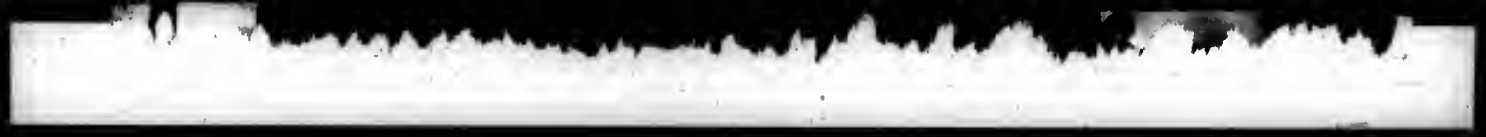

Bill Clinton

High-tech R&D, schools are top priorities

We're working with industry to loosen export controls on encryption products.

On wiring schools:
I have set a goal of connecting every classroom, library, hospital and clinic to the information superhighway by 2000. If the private sector and government work together, we can ensure that all of our children are able to use PCs and the Internet to access the information they need. Our students must learn the job skills they will need to prosper in the digital age.

Vice President Al Gore and I have visited more than half a dozen schools to highlight the importance of educational technology, including participation in the Net Day "electronic barn raising."

I have also called on the Federal Communications Commission and state regulators to give every school and library in the country the lowest possible "E-rate," or education rate, including free basic service to the Internet.

On encryption policy:
There are no controls on the domestic manufacture and use of encryption. But because encryption can be used by criminals and terrorists to thwart wiretaps and hide their actions, the U.S. has controlled exports of the strongest forms of encryption.

We have worked with industry to loosen restrictions on the export of encryption so that Americans will be able to better protect their data and communications and American companies can meet their foreign customers' demands for stronger encryption.

On Oct. 1, my administration announced that it would allow companies to export encryption products and services using Data Encryption Standard (DES) and equivalent algorithms for the next two years, provided they work with the government to develop "key-recovery" encryption products. That would enable the government to decode encrypted data if legally authorized. Such key-recovery products will provide even stronger protection than DES, without posing a threat to public safety and national security.

On high-tech research and development:
My administration has made investment in R&D a top priority, especially for information technology. For instance, we have strengthened the High Performance Computing and Communications Initiative, which then-Sen. Gore helped launch in 1991. And we have expanded the Advanced Technology Program at the Department of Commerce, which provides matching grants to companies so they can turn good ideas into new technologies.

The administration believes that the federal R&D tax credit is an effective way to spur investment in research, and we will continue to urge Congress to make the credit permanent.

On privacy:
If not properly addressed, concerns about privacy could be a major roadblock in the information superhighway. That is why last year my administration published a report defining "privacy principles" for the use of personal electronic data. These guidelines would ensure that the public and private sectors don't abuse electronic information about individuals. They would ensure that individuals could control what kind of information is being collected about them and how it is being used.

The administration is exploring how we can better address online privacy concerns and whether there is a need for additional staff and resources to be devoted to this problem.

This column is based on written responses from the Clinton/Gore '96 campaign (www.cg96.org) to a *Computerworld* questionnaire.

Bob Dole

Encryption controls hurt 'net commerce

Washington bureaucrats don't make good venture capitalists for high-tech industries.

On wiring schools:
Instead of throwing billions of dollars worth of computers and connections at schools that aren't able to handle the technology, the Dole administration will encourage American companies to "adopt" public schools, particularly those in inner cities. The companies will provide the schools with computer equipment that becomes available when the companies upgrade their computer systems. The companies would also provide maintenance and support, as well as show teachers how best to use computers.

The taxpayers shouldn't pay for new computers that have capabilities — and costs — beyond what the schools really need.

On encryption policy:
The Clinton/Gore encryption policy has been a major roadblock for electronic commerce. One of Clinton's first acts as president was to announce the Clipper encryption plan, which was soundly condemned by the computer science community. Americans simply don't trust government enough to give it the keys to their private information.

The announcement also advertised to criminals that the way to protect their information from law enforcement is through encryption, something many had never heard of until the Clinton announcement.

Vice President Gore's recent announcement of "Clipper III" shows that the current administration still doesn't understand how it is hurting electronic commerce and security and encouraging foreign companies to move into an important market.

I cosponsored the Pro-Code bill, which recognizes today's realities about encryption and will allow American companies to market products that will keep vandals out of our computer systems. Encryption is already available to anyone who wants to use it, and the Clinton/Gore restrictions place American software producers at a competitive disadvantage in the world market.

On high-tech research and development:
The Dole/Kemp tax cuts will put more money in the hands of Americans to invest in companies whose R&D efforts make them attractive. Capital gains tax relief will reward investors who have taken the risk with their own money to build America's high-tech industries. The larger question of whether the R&D tax credit should be made permanent will be decided in the context of overall tax reform.

I have been a strong supporter of federally funded basic research, but the federal government shouldn't be a venture capitalist. Clinton's programs to fund product development are failures and must be eliminated. American venture capitalists are knowledgeable and realistic about their investments and are staking their own money on their judgment. Why would anyone believe that a Washington bureaucrat could do the job better?

On privacy:
The Clinton/Gore administration has restricted the best way to prevent many privacy abuses: strong encryption that prevents monitoring of online activities and makes computer break-ins unproductive.

As a co-sponsor of the Pro-Code bill, I recognize the importance of a realistic policy toward encryption to protect privacy. The solution isn't stronger federal laws, but allowing people to protect their own information.

People also need to be informed when personal information about them is included in a database, so they can review it for inaccuracies. They should be informed when personal information about them is transferred from one government agency to another.

This column is based on written responses from the Dole/Kemp '96 campaign (www.dolekemp96.org) to a *Computerworld* questionnaire.

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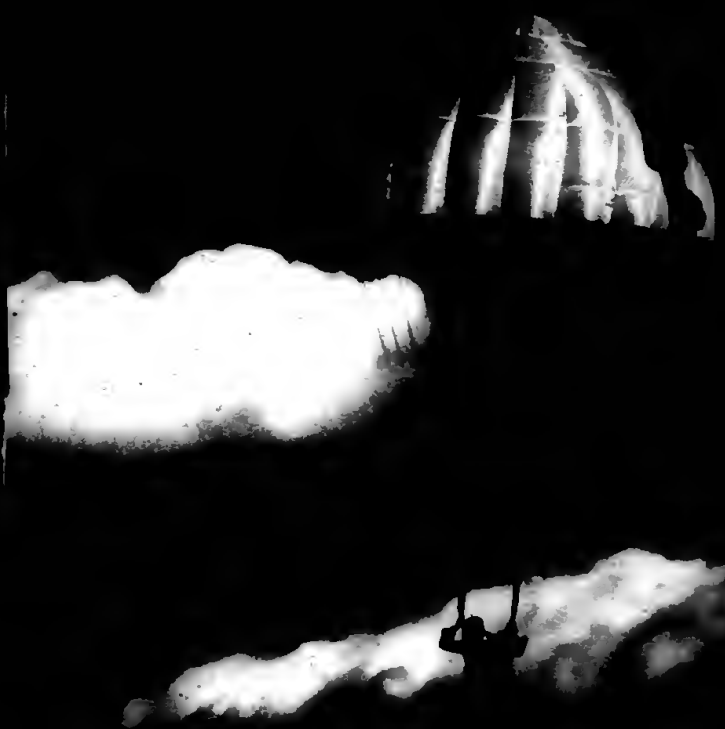

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Notes is fine, IBM service isn't

When IBM spent $3.5 billion to buy Lotus in July 1995, the conventional wisdom was that Lotus could only benefit from IBM's vast sales and service capabilities. On the other hand, there was widespread fear that IBM's bureaucratic culture would bog down product development at a time when Notes faced fundamental challenges from Microsoft and Internet-based alternatives.

A recent *Computerworld* survey of 150 large and midsize IS customers who use Lotus Notes and have an IBM mainframe or AS/400 system indicates that both of these assessments have turned out to be wrong.

By large margins, customers are satisfied with Notes and confident that Lotus is on the right track.

Some 75% of the respondents said Lotus is doing a good job integrating Notes with the World Wide Web. Three-quarters of the respondents also predicted the Internet won't endanger the overall Notes business. Customer interest in the Domino Web server and the upcoming Release 4.5 is high. If anything, IBM and Lotus should be doing more to market their strong product story.

Are they being served?

IBM's contribution in the sales and service arena has been a disappointment. Customers who say the quality of Notes service has declined since the acquisition outnumber those who say it has improved, by nearly a 4-1 margin. That's a huge difference for this type of question.

David Moschella

IBM was supposed to give Lotus Notes users great service. It hasn't.

The data is remarkably consistent across key service dimensions, including the quality of support and sales personnel, reliability and overall customer service.

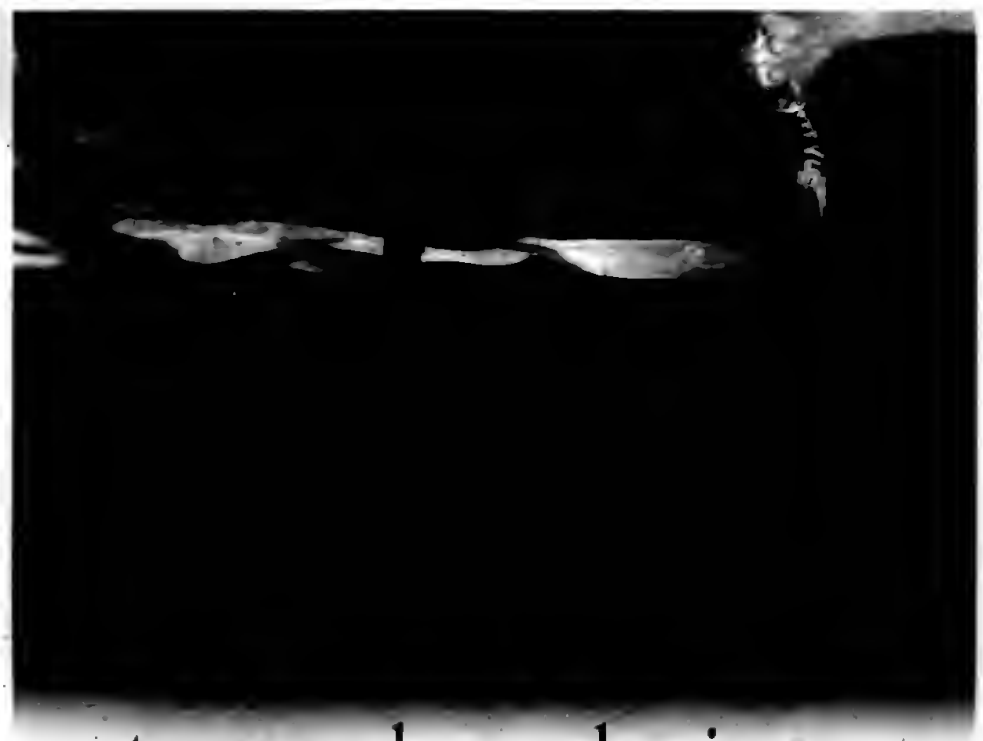
This poor performance is doubly troubling because Notes represents the essence of the reliable, secure, network-centric enterprise strategy Louis V. Gerstner has adopted.

Outside of the data center, Notes is really the only IBM product that is a clear industry leader; it is still IBM's best chance to stop many of its customers from becoming virtually all-Microsoft shops.

Given this, Notes customers should be getting the best service IBM has to offer. If IBM can fall down in such a high-profile area, it has to make one wonder about its other commitments, especially after the Olympics fiasco. This is bad news for a company that has increasingly focused on its services business.

Now, for unrelated reasons, the Lotus executive team has been reshuffled; Jeff Papows is president and Deborah Besemer has taken over worldwide sales and services. But because many of the problems are on the IBM side of the house, IBM executives John Thompson and Ned Lautenbach are really the ones responsible for assuring that this year's poor customer service record was only a temporary lapse.

Moschella is senior vice president of research at Computerworld, Inc. His Internet address is david_moschella@cw.com.



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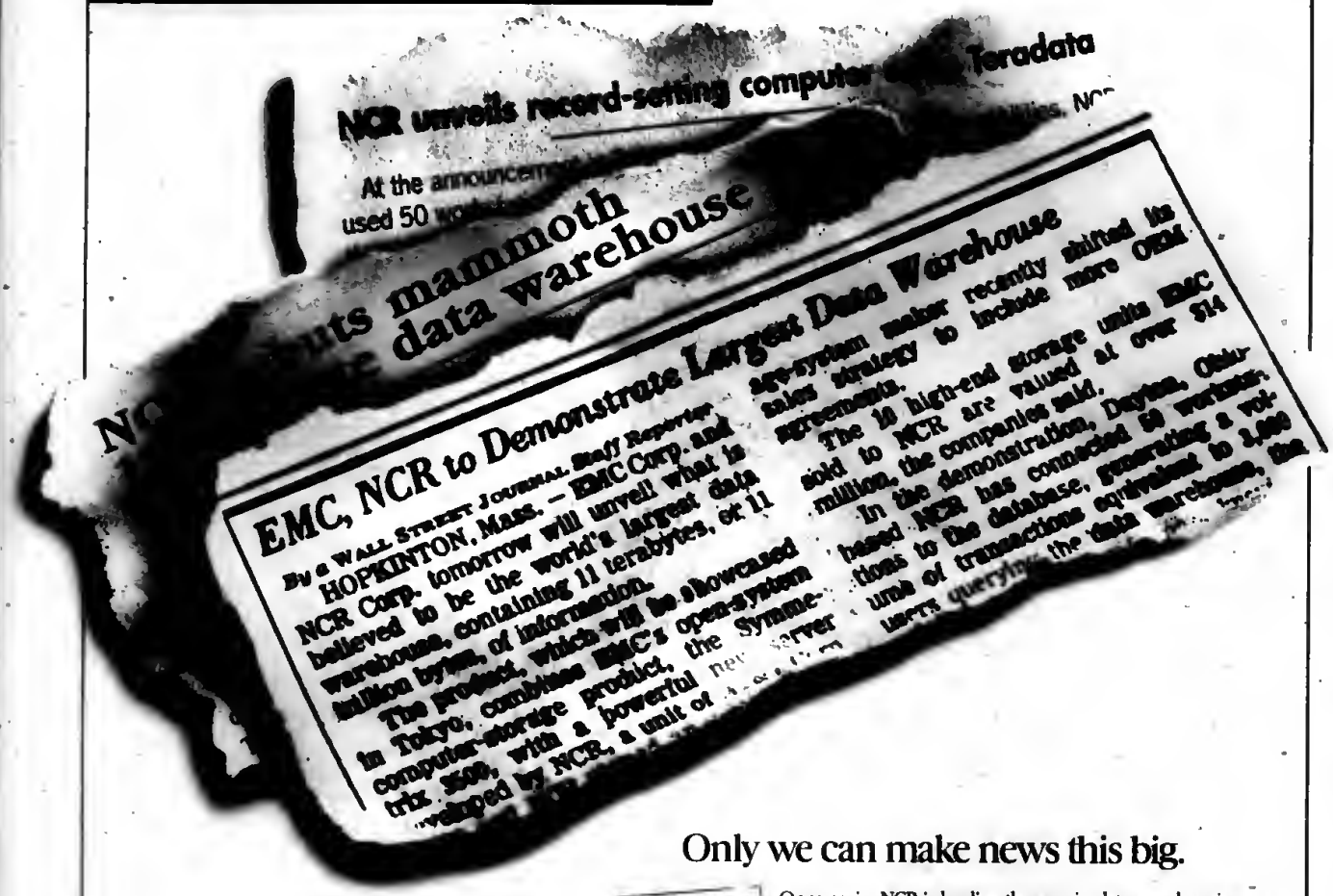
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By a Wall Street Journal Staff Reporter
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Apple eyes mobile users

Niche products emerge from restructured division

By Lisa Picarille

Apple Computer, Inc. this week will take the wraps off two sub-$1,000 mobile computers: a portable computer that targets educators and a new version of its Newton handheld device for mobile professionals and medical workers.

The EMate 300 and the MessagePad 2000 are the first products to come out of Apple's Information Appliance Division, which was formed in May during a companywide restructuring [CW, May 20].

An updated version of Apple's Newton personal digital assistant (PDA), the MessagePad 2000 is aimed at mobile business professionals. Due in the first quarter of next year, it features a new, higher-performance processor, a larger screen, improved battery life for 24 hours of continuous use and built-in productivity and communications software.

The device uses the latest Apple Newton operating system, Version 2.1, and is based on Advanced RISC Machines Ltd.'s StrongARM SA-110 RISC processor that runs at 161.9 MHz. Users also get a word processor, spreadsheet, personal information manager, World Wide Web browser and electronic-mail software (see chart).

James Staten, an analyst at Dataquest, a market research firm in San Jose, Calif., applauded Apple's move to increase the size of the Newton's screen to 4 by 8 in., half the size of a standard PC monitor.

Despite the improvements, the MessagePad 2000 may still have limited appeal. Only 480,000 handheld devices were sold worldwide last year, according to Data-

Apple, *page 43*

Portable prospects

MessagePad 2000		EMate 300	
Operating system:	Newton Version 2.1	**Bundled with:**	Web browser, E-mail, spreadsheet, word processor, drawing program, graphing calculator, address book, notepad, calendar, database, science and math programs
Processor:	161.9-MHz StrongARM SA110	**Modem:**	Built in
Weight:	Just more than 1 pound	**Weight:**	4 pounds
RAM:	5M bytes	**Price:**	Less than $800
Slots:	2PCMCIA		
Keyboard:	Included		
Price:	Expected to be less than $1,000		

Gartner: Performance clusters aren't needed

By Jaikumar Vijayan

Despite vendor efforts to push clustering and massively parallel server systems, symmetrical multiprocessing (SMP) will meet most performance requirements over the next five years.

In fact, users might resist the highly scalable systems because they are seen as overkill and confusing to implement, according to a recent report by Gartner Group, Inc. in Stamford, Conn.

"Vendors are promoting different types of clustering technologies as the best, most scalable way of doing things. But most users are not going to need scalability beyond what SMP offers," said Joe Barkan, an analyst at Gartner.

"Besides, SMP is a known technology; it makes things relatively simple, and you have the ability to scale pretty far with it," Barkan added.

As a result, only 10% of applications will require the kind of performance scalability offered by cluster and massively parallel processor server implementations over the next few years, according to the Gartner report.

Five-year server plan

Key server platform differentiators during the next five years include:

Performance and scalability
The system will need to support more than 500 OLTP users

High availability
At least 99% uptime

Software availability
Packaged vertical-industry applications; leading-edge development tools

Service and support
Worldwide service and support

Source: Gartner Group, Inc., Stamford, Conn.

Although clustering will continue to be touted by vendors, it probably will be only the third-best approach to performance scaling, behind SMP and Non-Uniform Memory Access architecture, Gartner said.

At the same time, Unix and Windows NT clusters will continue to be attractive options for systems availability, the report said.

"Performance isn't the only measure. How long a system can stay up is also quite critical" in making implementation decisions, said Jonathan Eunice, president of Illuminata, Inc., a

Gartner, *page 42*

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Gartner: SMP fills performance need

CONTINUED FROM PAGE 41

consultancy in Nashua, N.H.

"Basically, what users are looking for is a mix of scalability and availability," Eunice said. As far as application availability requirements are concerned, clustering is probably the best option, he added.

Redundant protection

In clustering, several servers are tied together to appear as one system to applications and users. That provides hardware redundancy and scalability.

By comparison, SMP boxes run multiple jobs simultaneously on different processors, which reduces programming complexity and opens the servers up to packaged applications.

Whereas SMP puts multiple processors together in one system enclosure, clustering puts them together in multiple system enclosures.

"We have looked at SMP as providing the scalability needed for performance," said Ratan Bahavnani, director of software development at Autologic Information International, Inc., a manufacturer of customized systems for the publishing industry in Thousand Oaks, Calif.

Clusters provide the needed failover capabilities, "but we don't see clusters sharing the workload effectively just yet," Bahavnani said.

Autologic has been using SMP systems to develop some of its compute-intensive raster image processing applications for publishers. By using SMP servers, it has reduced processing times from more than an hour to just less than a minute for some applications.

According to the Gartner report, Unix systems will continue to outscale Windows NT systems during the next five years or so, despite rapid gains by the Wintel camp.

However, Windows NT will scale well enough to meet most database and application server requirements as early as 1998. Ongoing support and maintenance costs will also continue to favor NT implementations over Unix, according to Gartner.

Clustered Solaris

There's a Full Moon rising over Sun these days.

SunSoft, Inc., the software arm of Sun Microsystems, Inc., is working on a scalable clustering technology code-named Full Moon, which it will integrate with an upcoming version of the Solaris operating system.

Scheduled to be available in the first half of next year, Full Moon is the second major clustering initiative announced by Sun this year. Earlier this month, Sun announced high-availability clustering technology for its Ultra Enterprise family of SPARC servers.

Whereas Sun's current products provide high-availability, failover clustering, Full Moon will also allow performance clustering.

According to a Sun spokesman, Full Moon will give users high scalability and can be implemented on machines that range from small department servers all the way up to large server clusters. The cluster will allow users to scale their systems according to their application needs and will provide continuous, uninterrupted access to applications and services, the spokesman said.

Full Moon further strengthens Sun's sudden — and relatively recent — commitment to clustering technology, analysts said. But the company is still far behind the competition. — *Julekha Pilyasuo*

Apple going after mobile users

CONTINUED FROM PAGE 41

quest. "If you weren't interested in the Newton before, you're not going to be interested now," Staten said.

Observers also said pricing could be an issue. The MessagePad 2000 is expected to cost less than $1,000, but increased competition from PDA newcomers Corel Corp. and Microsoft Corp. could drive rival prices well below the $1,000 mark.

Chris Cain, a computer systems specialist at Carson Group, a financial services company in New York that has outfitted a few workers with Newton MessagePads, said he would like to see the Newton function more like a portable calendar and address book and less like a laptop computer.

"Having things like extra programs and a larger screen is not that big a deal when you're doing addresses, appointments, 'to do' lists and quick notes," Cain said. "And if you want a larger screen size, why not just get a PowerBook?"

But not everyone wants to pay the hefty cost of portables, particularly the cost-conscious education market. For that market, Apple is readying its EMate 300 portable device, priced at less than $800.

School boys

According to Fred Anderson, Apple's chief financial officer, the company had its highest-ever sales into the education market in its fiscal fourth quarter, which ended Sept. 27. And sales of PowerBooks accounted for 25% of the 932,000 units Apple sold in the quarter.

The EMate 300 is a 4-pound portable device that sports a stylish and rugged outer casing with a built-in handle. Based on Version 2.0 of the Newton operating system, EMate 300 includes a Web browser, E-mail program, spreadsheet, word processor, drawing program, graphing calculator, address book, notepad and calendar (see chart, page 41).

The device, which is slated for delivery in the first quarter of next year, also comes bundled with a variety of education-specific software and a modem.

Briefs

Octopus protects data

Octopus Technologies, Inc. has introduced WinStation for Windows 95, a software product designed to mirror data and provide fault tolerance in the event of a hardware failure, natural disaster or human interference. Octopus WinStation for Windows 95 costs $49.

EMC on Fed contract

PRC, Inc., which contracts with the U.S. government to provide computer systems, has agreed to offer EMC Corp.'s Symmetrix 3500 disk storage systems under contract. The indefinite delivery contract makes the 3500 the preferred storage platform to be sold with Hewlett-Packard Co.'s HP 9000 servers.

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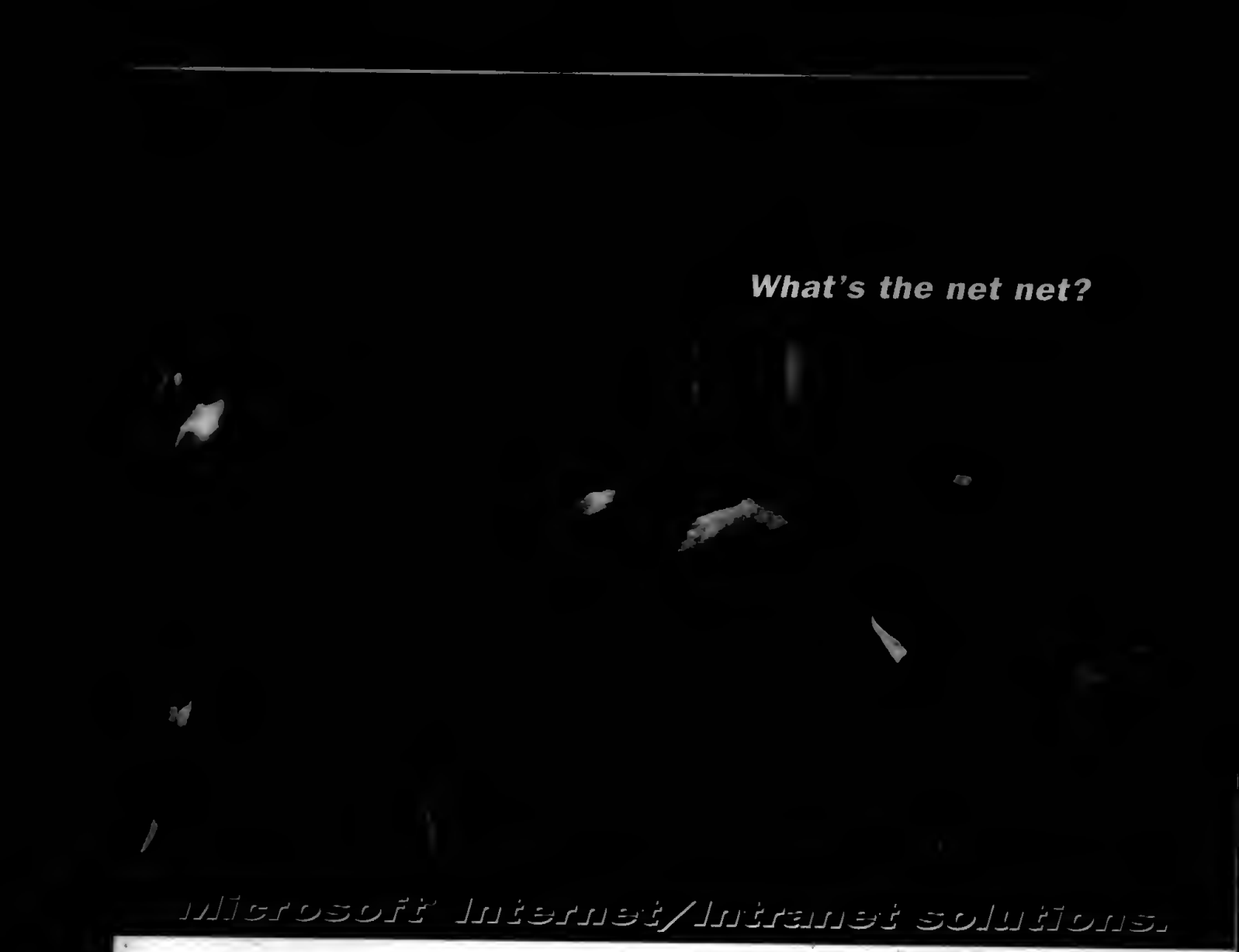

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G. 50 – 99	☐	☐
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60. Government - State/Federal/Local
69. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/ Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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Operating Systems			
(a) Solaris		(e) Mac OS	
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App. Development Products	☐ Yes	☐ No	
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Complex dependencies among applications have high potential for failure, 46

Software

Not a prime-time player

Sun's Java lacks supporting tools, middleware, third-party libraries

By Frank Hayes and Sharon Gaudin

After nine months of hype, hope and bad coffee puns, Java is still not quite ready for prime time. But that isn't stopping some corporate developers who are using it anyway.

Sun Microsystems, Inc.'s Java is easier to use than languages such as C++, developers said, and it lets users deploy small pilot projects quickly over the Internet on World Wide Web pages. That can serve as a springboard to larger client/server projects that will run on corporate intranets.

Closer Look
Java applications

"We are using Java for some real corporate development — big internal applications that are managing important systems for us," said Larry Hagerty, senior systems analyst at GTE Data Services in Tampa, Fla., a subsidiary of GTE Corp.

But not everyone is ready to jump in with both feet.

"We're not currently doing any Java application development," said a systems analyst at a paper manufacturer in Chicago. "I just presented a summary of Java to our development groups recently, and some expressed interest. But I have no idea if they're going to follow through."

On their minds

The question for many corporate developers is whether Java has what it takes for real corporate development — all the supporting tools, middleware and third-party libraries that it takes to build client/server applications.

"No, [Java] is not ready for corporate development," said Paul Mahowald, vice president of retail systems development at Blockbuster Entertainment Group in Fort Lauderdale, Fla. "It doesn't have the class libraries." It will improve, he said, but for now, "you have to do everything yourself."

And the shortage of third-party Java libraries brings some developers face-to-face with bugs in Java's own base libraries. "When we try to customize it, every time we do something there's a new surprise," said Nate Zuckerberg, a program manager at the U.S. Postal Service in Washington. Still, the bugs won't prevent the Postal Service from beginning field tests on a Java-based electronic form for bulk-mail customers, he said.

Another area of weakness is the lack of graphical Java development tools, according to Larry Podmolik, director of technology at Strategy Technology Resources in Chicago, a consultancy that has worked with printing giant R. R. Donnelley & Sons Publishing Corp. on a major Java application.

Several vendors, including Microsoft Corp. and Symantec Corp., have retrofitted their C++ development environments to let developers write Java code. But corporate developers don't want reconstituted C++ editors — they want Java visual development environments that work like Microsoft's Visual Basic or Sybase, Inc.'s PowerBuilder.

"If somebody ripped out Visual Basic and stuck Java underneath, it would be perfect," said Steve Yalovitser, a Java consultant at Deductive Corp. in New York who has built Java applications for Chemical Bank and other corporate clients.

GTE Data Services' Larry Hagerty: *'I'm more or less staking my reputation on Java being here to stay'*

Symantec's Visual Cafe and Rogue Wave Software, Inc.'s JFactory come much closer to that approach, letting developers build Java programs by dragging components into place using a mouse. But other long-expected visual Java tool sets — including Borland International, Inc.'s Latte, which was designed to match the ease of use of Borland's popular Delphi development environment — aren't available yet.

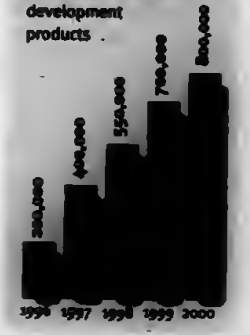
Ironically, Java's most widely publicized shortcomings don't concern developers working on internal Java applications. Security researchers have discovered holes in Java that make it possible for hostile Java applets downloaded across the Internet to wreak minor havoc on users' machines.

Those security problems are less of a concern for internal client/server developers because they can control what goes into the software they develop. Java's security features make it less prone to cause problems for internal client/server applications than most other languages, according to users.

"It's just the maturing of this technology, and it will work itself out," said Tom Boos, vice president of information technology at the Coris division of R. R. Donnelley. He said Sun's JavaSoft unit has patched the embarrassing problems as quickly as they have appeared.

Brewing more Java

Projected number of professional developers using commercial Java development products



Source: International Data Corp., Framingham, Mass.

Connection concerns

However, corporate developers are concerned about how Java will connect to legacy applications and databases. Sun has defined a standard for database access known as Java Database Connection, which IBM, Oracle Corp., Informix Software, Inc., Sybase and other database vendors have agreed to adopt. But just as important is Java's ability to connect to mainframe and minicomputer applications — an area where vendors are just beginning to deliver products.

But ready or not, some corporate developers are staking their projects — and more — on Java.

"I'm more or less staking my reputation on Java being here to stay," Hagerty said.

Multiple platforms? Maybe

Java applications are supposed to be platform-independent — and they are, to a point.

But developers are learning that even though Java code may run the same on different computers, distributing and installing that code isn't so simple.

"The installation method [for all software] is different for a Windows PC than for a Mac or Unix," said Paul Jaquish, president of the government systems division at Enterprise Productivity Systems, Inc. in Napa, Calif. The company helped the Postal Service build a Java-based electronic-forms application.

The differences among platforms raised concerns for the Postal Service, which must make sure its customers can download the appropriate Java runtime software for their computers.

"Windows 95 and NT are no problem," said Nate Zuckerberg, a Postal Service program manager, ticking off the popular platforms. "Mac should be OK, and Unix is OK."

The program initially wouldn't run using IBM's beta Windows 3.1 version of Java, "but that got straightened out," Zuckerberg said. "We're just working those problems out as we come to them."

— Frank Hayes and Sharon Gaudin

Application Development

Points of failure abound in complex app structures

By Sharon Gaudin

Adding client/server applications. Moving applications to the Internet.. Buying components. Building an intranet.

Every layer added to a business's application environment increases its complexity and creates more potential points of failure.

"If you step back and look at it, the complexity is mind-boggling," said Larry Hagerty, an information systems manager at GTE Data Services in Tampa, Fla., a subsidiary of GTE Corp. "I would like to say I do plan them out and map the links, but the fact of the matter is, we don't have the detailed documentation that would give an IS manager a comforted feeling."

"There are so many more details that most people, including me, just aren't used to thinking about. The complexity has increased by a factor of 10," said an IS manager at a major U.S. pharmaceutical company, who asked to remain anonymous. The manager cited factors that add layers of uncertainty, such as users who seek World Wide Web access, Internet and intranet security issues and network configurations.

David Kelly, director of application strategies services at Hurwitz Group, Inc. in Newton, Mass., said that as stresses increase for corporate IS managers, the chances increase of making a mistake or overlooking a critical link that could shut down a business's entire operation.

How to avoid an application meltdown

- Learn systems and their quirks
- Build diagrams of application interdependencies
- Consider event management software to detect and prevent errors
- Find out how components are structured and what software they depend on

A different view

This sense of risk "has exploded the traditional view of the application life cycle," Kelly said at a one-day Hurwitz conference in Chicago this month on preventing application meltdown. "It's a much messier picture. You can't change this increase in complexity. You can only manage it."

Because of the increasing complexity, many IS managers must do a better job of planning their software development process so they can also keep their applications up and running, he said.

Judith Hurwitz, president of Hurwitz Group and keynote speaker at the conference, said the key to riding herd over a wide array of powerful applications is to plan ahead.

"Before you write a line of code, plan instrumentation. Look at how you'll collect data about problems. Look at code management and integration management," Hurwitz said.

Hurwitz and Kelly said IS managers should be aware of what is coming down the road. That insight comes via application development teams made up of developers and operations managers.

"You can build a great application, but it's useless if you can't manage it," Kelly said.

A first-rate report writer

By Howard Millman

Contrary to scientific theory, the most elusive piece of matter in the universe isn't a quark. It's the last bit of information you need to complete a task.

One time-tested method of retrieving essential data is a report writer, and Seagate Software, Inc.'s recently released Crystal Reports 5.0 ranks among the best in its field.

Seagate has added relatively few features to the newest release of Crystal Reports, but they are important: a more intuitive interface, subreports that summarize the full report, a free-form Report Designer, templates and wizards.

PRODUCT REVIEW

Crystal Reports 5.0's wizards, which are intelligent macros, gave me welcome assistance in creating a wide variety of report types. Its new tabbed dialog boxes made most decisions a matter of "click to pick" as I identified my data sources, tables and output options.

I tested the $395 professional version, meant for information systems staffers, and found that it helps create easy-to-read, professional-looking report templates.

I began by modifying Crystal Reports' sample files, changing selected text and layout items until I had a document that reported sales by territory and product type and sorted by dollar amount and sales volume.

Although I went on to create reports by using templates and wizards, I preferred to modify the samples by using Crystal Reports' convenient drag-and-drop design features. The package offers more than 100 predesigned reports.

The interface improvements will enable in-house developers who work with existing data sources to prepare a report with a point and a click. For more advanced projects, programmers familiar with Microsoft Corp.'s Visual Basic controls or Foundation Class Library or Borland International, Inc.'s Delphi VCL can embed Crystal Reports' report engine in their custom applications.

The professional version's license agreement sanctions royalty-free distribution. One of those distribution methods outputs reports in Hypertext Markup Language (HTML) for direct posting on an intranet.

Enhancements to report appearance include multiple formats in one report and the ability to embed subreports in a primary report. Subreports can share a common data source or use multiple and separate data sources, thereby allowing for multiple views of the same data.

Go professional

The two versions of Crystal Reports — professional and standard — target very different markets.

The standard version, which lacks server access, is limited to accessing data stored in a non-SQL database that resides on the same machine as the application. The professional version gives developers access to remote client/server databases, libraries and links to all popular databases. That versatility makes the professional version worth the extra money.

In earlier versions, a designer's control over the report's final appearance was limited to placing objects in matrix cells. The current version's Report Designer lets you place text, data fields and graphics objects anywhere on a page. New ActiveX support and parameter fields give developers wide latitude in accommodating user input at runtime.

Overall, the effect of the enhancements is to give developers infinite control over the final appearance of a report.

Crystal Reports 5.0
Seagate Software, Inc.
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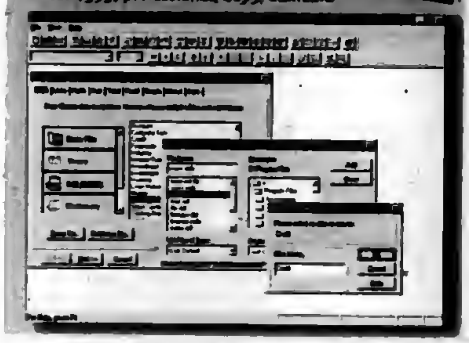
Price: $395, professional; $195, standard

Overall grade: A



To its credit, Seagate also corrected some annoying insufficiencies. For example, it has simplified the process of modifying a report. Previously, the Report Expert locked in the design, making it difficult to edit the report.

Adding to its comprehensive list of supported databases, Crystal Reports 5.0 adds support for Microsoft Exchange and databases from Informix Software, Inc. and Arbor Software Corp. It also adds native drivers for Oracle Corp. and Sybase, Inc. SQL Server, bringing its total to more than 25 PC and SQL data sources.

It exports reports in Microsoft Excel, Access and Word; Lotus Development Corp. 1-2-3 and Notes; Corel Corp. WordPerfect; and HTML and text formats. It also exports reports as data sets for Open Database Connectivity access.

Overall, Crystal Reports 5.0 deserves high marks for time and effort savings. Accept its moderate learning time, and you will be rewarded with eye-catching, informative reports.

Millman operates the consultancy Data System Services Group and is the co-author of the forthcoming *Netscape Server Bible* from IDG Books Worldwide. He can be reached at hmillman@mcimail.com.

Application Development

Points of failure abound in complex app structures

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Adding client/server applications. Moving applications to the Internet. Buying components. Building an intranet.

Every layer added to a business's application environment increases its complexity and creates more potential points of failure.

"If you step back and look at it, the complexity is mind-boggling," said Larry Hagerty, an information systems manager at GTE Data Services in Tampa, Fla., a subsidiary of GTE Corp. "I would like to say I do plan them out and map the links, but the fact of the matter is, we don't have the detailed documentation that would give an IS manager a comforted feeling."

"There are so many more details that most people, including me, just aren't used to thinking about. The complexity has increased by a factor of 10," said an IS manager at a major U.S. pharmaceutical company, who asked to remain anonymous. The manager cited factors that add layers of uncertainty, such as users who seek World Wide Web access, Internet and intranet security issues and network configurations.

David Kelly, director of application strategies services at Hurwitz Group, Inc. in Newton, Mass., said that as stresses increase for corporate IS managers,

the chances increase of making a mistake or overlooking a critical link that could shut down a business's entire operation.

A different view

This sense of risk "has exploded the traditional view of the application life cycle," Kelly said at a one-day Hurwitz conference in Chicago this month on preventing application meltdown. "It's a much messier picture. You can't change this increase in complexity. You can only manage it."

Because of the increasing complexity, many IS managers must do a better job of planning their software development process so they can also keep their applications up and running, he said.

Judith Hurwitz, president of Hurwitz Group and keynote speaker at the conference, said the key to riding herd over a wide array of powerful applications is to plan ahead.

"Before you write a line of code, plan instrumentation. Look at how you'll collect data about problems. Look at code management and integration management," Hurwitz said.

Hurwitz and Kelly said IS managers should be aware of what is coming down the road. That insight comes via application development teams made up of developers and operations managers.

"You can build a great application, but it's useless if you can't manage it," Kelly said.

A first-rate report writer

By Howard Millman

Contrary to scientific theory, the most elusive piece of matter in the universe isn't a quark. It's the last bit of information you need to complete a task.

One time-tested method of retrieving essential data is a report writer, and Seagate Software, Inc.'s recently released Crystal Reports 5.0 ranks among the best in its field.

Seagate has added relatively few features to the newest release of Crystal Reports, but they are important: a more intuitive interface, subreports that summarize the full report, a free-form Report Designer, templates and wizards.

Crystal Reports 5.0's wizards, which are intelligent macros, gave me welcome assistance in creating a wide variety of report types. Its new tabbed dialog boxes made most decisions a matter of "click to pick" as I identified my data sources, tables and output options.

I tested the $395 professional version, meant for information systems staffers, and found that it helps create easy-to-read, professional-looking report templates.

I began by modifying Crystal Reports' sample files, changing selected text and layout items until I had a document that reported sales by territory and product type and sorted by dollar amount and sales volume.

Although I went on to create reports by using templates and wizards, I preferred to modify the samples by using Crystal Reports' convenient drag-and-drop design features. The package offers more than 100 predesigned reports.

The interface improvements will enable in-house developers who work with existing data sources to prepare a report with a point and a click. For more advanced projects, programmers familiar with Microsoft Corp.'s Visual Basic controls or Foundation Class Library or Borland International, Inc.'s Delphi VCL can embed Crystal Reports' report engine in their custom applications.

The professional version's license agreement sanctions royalty-free distribution. One of those distribution methods outputs reports in Hypertext Markup Language (HTML) for direct posting on an intranet.

Enhancements to report appearance include multiple formats in one report and the ability to embed subreports in a primary report. Subreports can share a common data source or use multiple and separate data sources, thereby allowing for multiple views of the same data.

Go professional

The two versions of Crystal Reports — professional and standard — target very different markets.

The standard version, which lacks server access, is limited to accessing data stored in a non-SQL database that resides on the same machine as the application. The professional version gives developers access to remote client/server databases, libraries and links to all popular databases. That versatility makes the professional version worth the extra money.

In earlier versions, a designer's control over the report's final appearance was limited to placing objects in matrix cells. The current version's Report Designer lets you place text, data fields and graphics objects anywhere on a page. New ActiveX support and parameter fields give developers wide latitude in accommodating user input at runtime.

Overall, the effect of the enhancements is to give developers infinite control over the final appearance of a report.

To its credit, Seagate also corrected some annoying insufficiencies. For example, it has simplified the process of modifying a report. Previously, the Report Expert locked in the design, making it difficult to edit the report.

Adding to its comprehensive list of supported databases, Crystal Reports 5.0 adds support for Microsoft Exchange and databases from Informix Software, Inc. and Arbor Software Corp. It also adds native drivers for Oracle Corp. and Sybase, Inc. SQL Server, bringing its total to more than 25 PC and SQL data sources.

It exports reports in Microsoft Excel, Access and Word; Lotus Development Corp. 1-2-3 and Notes; Corel Corp. WordPerfect; and HTML and text formats. It also exports reports as data sets for Open Database Connectivity access.

Overall, Crystal Reports 5.0 deserves high marks for time and effort savings. Accept its moderate learning time, and you will be rewarded with eye-catching, informative reports.

Millman operates the consultancy Data System Services Group and is the co-author of the forthcoming *Netscape Server Bible* from IDG Books Worldwide. He can be reached at hmillman@mcimail.com.

THE BUILDERS

"WHEN IT WAS TIME TO INTEGRATE 43 DATABASES INTO A WAREHOUSE... IT WAS TIME TO CALL THE BUILDERS."

PJ Matarese, Senior Analyst, Philips Semiconductors

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Microsoft licensing policy raises cost concerns

By Lisa Picarille

Microsoft Corp. has streamlined its licensing policy, but some users are concerned that fewer options will trigger higher costs.

Under fire from customers and critics about the complexity of its software licenses, Microsoft earlier this month unveiled its Select 4.0 licensing program that attempts to simplify the process.

The program will benefit the vast majority of users, but large customers who have found advantageous solutions to Microsoft's licensing puzzle may end up losing some volume discounts, analysts said.

Simpler licenses

Microsoft's new licensing program

Select 4.0

- Targets businesses with 1,000 or more PCs
- Offers four levels of volume discounts
- Requires two-year contract
- Offers discount up front
- Bases discouot on two-year purchase forecast

Open License 4.0

- Targets businesses with 10 to 1,000 PCs
- Offers three levels of discounts
- Requires two-year commitment
- Bases discount on a buy-in price that is good for length of commitment

"The bottom line for users who had learned Microsoft's licensing program and how to take advantage of it [is that this] does nothing but raise prices for them," said Karl Strovink, an analyst at Gartner Group, Inc. in Stamford, Conn.

Some reasons for a possible price increase are the elimination of prorated maintenance fees (users will now pay a flat fee); the eliminatioo of Enterprise licenses, which provided the deepest discounts; and the discontinuation of a program that let users apply the purchase of software under one licensing agreement to another to obtain a "douhle discount," Strovink said.

Although Microsoft claims 20% of its licensing contracts were Enterprise licensing agreements, Strovink estimates that the number of companies potentially affected by the changes could be much higher.

"I would have a difficult time saying that for every customer prices will not go up," said Troy Oldham, licensing marketing manager at Microsoft's Enterprise Customer Unit.

One way costs might increase is if users want concurrent licensing. Microsoft eliminated concurrent licensing in June 1995, but users who want that option can pay for it under the Upgrade Advantage part of the program, which replaces Maintenance.

Lisa Laing, senior network systems analyst at McGill University in Montreal, said the elimination of concurrent user licensing undermines a years-long effort to implement software that meters concurrent usage. That could mean higher costs for McGill when coupled with the expense of adopting Microsoft's new licensing plan, Laing said. McGill has more than 5,000 networked PCs, 80% of which run Windows.

McGill has a decentralized purchasing system that makes it hard to forecast how many Microsoft products it will buy in the next two years, Laing said. Under Microsoft's plan, forecasting is a way to save on software licenses.

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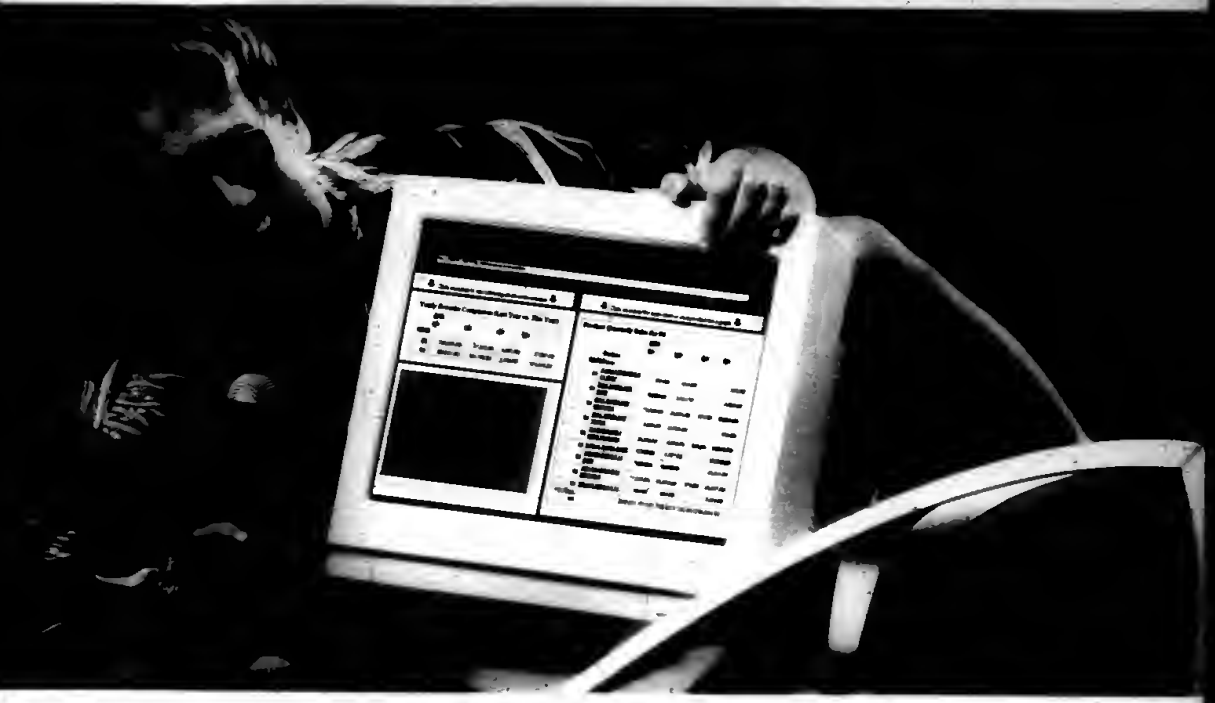

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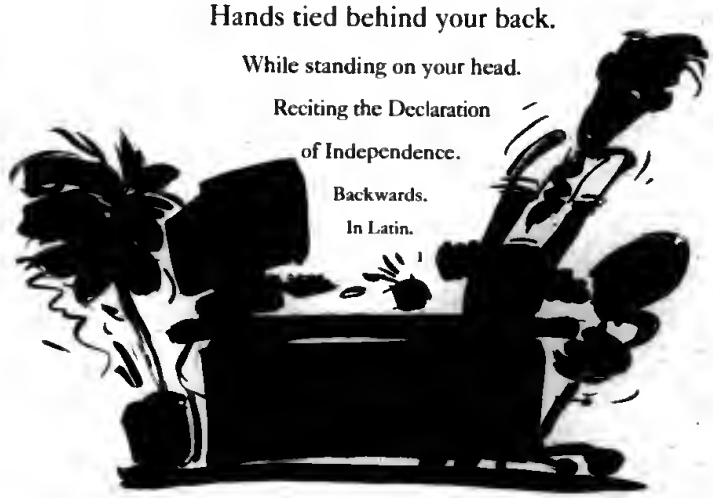

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The Enterprise Network

LAN/WAN mergers irk users

By Bob Wallace

Users said they see little, if any, benefit to the trend of LAN switching vendors diversifying by acquiring wide-area network equipment vendors.

In fact, users said those vendors should stick to their knitting instead of rushing into the lucrative WAN market.

"The recent acquisitions show that LAN vendors don't want to be left out of the WAN market," said Earl Perkins, a manager of network projects at Entergy Services, Inc., a utility in Gretna, La. "But by doing this, they could be making the mistake of letting their core markets erode."

The recent flurry of WAN vendor acquisitions includes Cabletron Systems, Inc., which announced plans to buy NetLink, Inc., a maker of equipment that lets LANs connect to wide-area frame-relay lines.

Also, 3Com Corp. detailed plans to buy Onstream Networks, Inc., which makes wide-area Asynchronous Transfer Mode line access gear. Earlier this year, Cisco Systems, Inc. merged with WAN switch vendor StrataCom, Inc., and IBM allied with StrataCom rival Cascade Communications Corp.

Many users agreed with Perkins. They said LAN switching vendors should focus on completing product lines and improving switching products. Some said the constant blur of mergers and acquisitions by LAN switching vendors has yet to provide substantial user benefits.

"I'm sick and tired of all these acquisitions," said Bill Horst, chief at the General Services Administration's communications branch in Philadelphia. "I don't believe most of them have advanced LAN switching that much. Many vendors are trying to keep up with Cisco." Cisco recently announced its 14th acquisition in roughly three years, but Horst said it hasn't fully integrated its new properties with its product line.

"Some of the LAN [switching] vendors don't have enough experience in what they're doing now, let alone pursuing the WAN equipment market," said Steve Lopez, network manager at the National Board of Medical Examiners in Philadelphia.

Many switches still need add-ons and enhancements such as high-speed uplinks for data center switches. "I'd like to see those areas addressed first," Lopez said.

But he said there will eventually be at least one benefit from the WAN vendor acquisitions. "I like to see these moves in the spirit of eventual competition," Lopez said.

Another user said one-stop shopping, a benefit trumpeted by vendors after they make acquisitions, may be overblown.

"One vendor can't always meet all of our criteria," said Richard Jackson, a systems engineer at travel services giant WorldSpan in Atlanta.

What's my benefit?

LAN vendors are buying WAN companies, but users aren't sure what, if any, benefits they'll receive

Vendor Benefit	Users comments
• Diversification	• Vendor should focus on core products/technologies
• Can provide one-stop shopping	• One-stop shopping isn't a key issue
• Growth through acquisitions	• Prefer greater competition
• Can apply skills to new areas or markets	• Vendors are already spread too thin

Jury still out on NT 4.0 trials

By Laura DiDio

Six weeks after its release, Microsoft Corp.'s Windows NT 4.0 is getting some mixed reviews from early adopters.

A dozen network administrators, expert users and systems integrators interviewed by *Computerworld* said they are generally pleased with the latest release of the operating system.

Merrick Printing's Matthew Merrick: *Windows NT 4.0 beta has offered a smooth ride*

Warnings

But users offered definite caveats about the lack of documentation for some features and the incompatible hardware drivers that can result in system crashes.

In general, large organizations such as Monsanto Co. and Electronic Data Systems Corp. that have been using Windows NT 4.0 for several months said they are especially pleased with what they consider a "significant performance boost" over Version 3.51. And they were equally enthused about the Windows 95 graphical user interface.

Al Ware, Windows NT 4.0 team leader at Monsanto in St. Louis, installed the upgraded Microsoft network operating system on 60 servers and 4,000 clients in August, just before the general release.

"In backups alone, we're seeing a 30% performance increase. That saves us five hours of management daily," Ware said. "We've also seen little to no upgrade hassles."

The upgrade to Windows NT 4.0 also has dramatically improved Monsanto's ability to manage server print queues and perform file management, Ware said.

Matthew Merrick, vice president of information systems at

Windows NT 4.0, *page 55*

Free Web tool manages network

IntraSpection lets users track SNMP devices

By Patrick Dryden

Administrators soon will be able to download free software that lets them check the status of any SNMP-enabled device from their favorite browser.

LAN hardware vendor Asante Technologies, Inc. this week will introduce such a tool for free distribution Nov. 15 on the World Wide Web.

IntraSpection gathers information available via the Simple Network Management Protocol (SNMP) and delivers it to operators anywhere via Java applets. That means administrators can sample Web-based management without an investment, without being limited to one vendor's product and without having to wait for vendors to adapt their tools to include browsers as consoles.

Music to their ears

Broad coverage by a free tool "almost sounds too good to be true," said Steve Tindall, an infrastructure project manager at Baxter Healthcare Corp. in Deerfield, Ill.

Sue Darte, connectivity specialist at Pennzoil Co. in Houston, said such a tool would give the operations group valuable remote access to devices. "And I like servers like this that run on Windows NT instead of Unix," Darte said.

IntraSpection lets operators watch internetworking gear, servers, stations and anything else equipped with an SNMP agent and manage them from a simple cross-platform interface at home or out among users.

Optional Personality Modules, which cost $99 each, add proprietary information about devices from Asante and other vendors. Then operators can track custom parameters or watch status lights on an exact representation of that device.

IntraSpection, *page 58*

IntraSpection *will be available to download for free Nov. 15 at www.asante.com*

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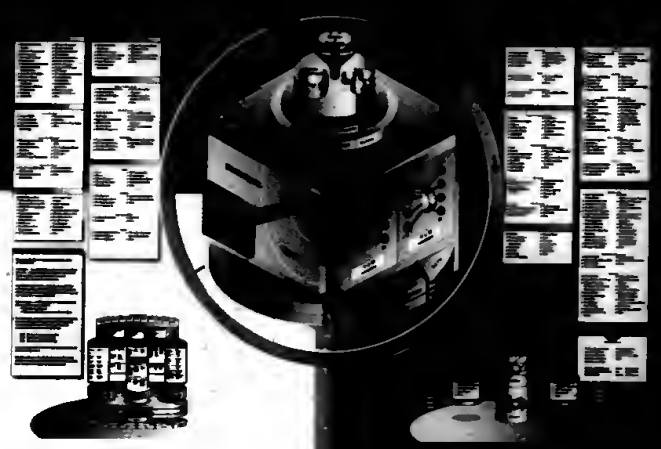
Client/Server "Aboveware " Road Map



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Aboveware™

So many software tools... So much confusion...

This special White Paper was written independently of Computerworld by Jeff Tash, president of Database Decisions, a division of Hewitt Associates, LLC.

Aboveware is responsible for creating the value-added that resides on top of an organization's client/server infrastructure. Aboveware represents the multitude of application development tools used to build client/server systems.

Before choosing any aboveware application development tool, it is imperative to understand that:

1. Tools shape the solution.
2. Problems get defined in terms of available solutions.

There is no single universal software development tool because there is no single universal type of software application. Rather, think in terms of three fundamentally different classes of computer applications:

- OLTP *(On-Line Transaction Processing)*
- OLCP *(On-Line Complex Processing)*
- OLAP *(On-Line Analytical Processing)*

Each class requires different underlying information models and application development approaches.

There are a multitude of application development tools currently on the market. The problem is trying to determine which products to use for various applications and tasks. That's where the Client/Server "Aboveware" Road Map can help. Included as a supplement to the August 1996 Computerworld Client/Server Journal, the Client/Server "Aboveware" Road Map serves as a progressive extension to the Client/Server Infrastructure Road Map, which appeared in Computerworld Client/Server Journal in both 1994 and 1995.

The Client/Server Road Map series is a collection of infographic wall posters that visually explain and help simplify the overwhelming complexity associated with client/server computing. The Road Maps provide a framework for describing the many different categories of client/server software products. These maps help prevent application developers from making erroneous product comparisons between "apples" and "oranges."

The Aboveware Road Map focuses on application development tools. The Infrastructure Road Map describes middleware products. A forthcoming Client/Server "Webware" Road Map will address the products associated with the development and deployment of Internet/Intranet applications.

OLTP vs. OLCP vs. OLAP

The Aboveware Road Map distinguishes three distinct classes of applications software. The first and most common is on-line transaction processing (OLTP), which includes the vast majority of existing, host-based, legacy applications. OLTP systems are characterized by transactions that are simple (a few lines of code) and short (a few seconds to a couple of minutes). Almost always, the data processed by an OLTP application is simple, consisting mainly of numbers, character strings and dates. Traditionally, OLTP applications automate operational systems. The target audience for most OLTP applicatioos is clerical workers (e.g., bank tellers, airline reservation clerks, order-entry personnel). The typical OLTP system involves simple updates posted against production databases by multiple concurrent users who are frequently geographically dispersed. Some OLTP applications involve large numbers of users, post high transaction volumes or access very large databases. Almost always, OLTP transactions are homogeneous and uniform (i.e., many people running the same applications simultaneously).

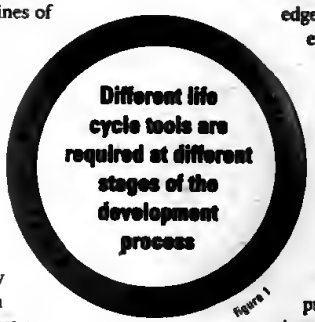

Figure 1

On-line complex processing (OLCP) contrasts with OLTP in that OLCP transactions involve complex data. OLCP must be able to handle text, graphics and image, as well as audio and video multimedia data types. OLCP must also be able to manage the requirements associated with application-specific complex data types, such as geographic maps, engineering drawings or seismic recordings. OLCP applications can also be fundamentally different than OLTP in other ways. For instance, OLCP transactions are frequently complex (many lines of code) and long-running (a few minutes up to sometimes several hours) and involve few concurrent users. Typically, the users of OLCP applications are a widely diverse and heterogeneous group of knowledge workers (e.g., engineers, stock brokers or customer service representatives). Object technology serves as the key enabler underlying OLCP, especially when coupled with workflow technology. The advent of objects, components and applets (e.g., OLE, Common Object Request Broker Architecture, ActiveX, OpenDoc and Java) is contributing to an explosive growth in the development of OLCP systems.

The third and last class of Aboveware deals with on-line analytical processing (OLAP). The popularity of OLAP has erupted along with the rapid emergence of data warehouses and data marts. In comparison with OLTP and OLCP, OLAP deals exclusively with read-only data. OLAP is driven by the business need to transform data into information. To accomplish this, knowledge workers must be able to perform ad hoc, exploratory analysis, accessing potentially very large amounts of data. OLAP applications are regularly designed to deal with multidimensional and aggregated data. This includes support for drill-down reporting, roll-up consolidations and slicing and dicing.

Regardless of whether you're building an OLTP, OLCP or OLAP application, all software development projects require life cycle tools. The traditional CASE "waterfall" methodologies that were used to build host-based applications are no longer popular. In their place, a new, more flexible rapid application development (RAD) approach has arisen. As illustrated in figure 1, this new style of development resembles a "spiral" of multiple, iterative passes through successive stages.

3-Tier and Transaction Management

The first generation of client/server applications was built and deployed using a "fat" client approach. With fat clients, all executable code resides on the desktop PC with the only exception being the database management system. As illustrated in figure 2, fat client applications issue SQL requests over the network to back-end relational database engines such as Oracle, Informix, Sybase, DB2 or SQL Server, which then send data back and forth.

figure 2

A major problem that software developers have experienced with the fat client approach involves version control and configuration management. In the fat client model, every software change necessitates that new code be reinstalled to perhaps hundreds or even thousands of desktop systems. This has rapidly grown into a management nightmare as more and more client/server applications have moved into production.

It's extremely costly and logistically difficult to constantly push modified software modules out onto client desktop machines. Moreover, it's impossible to install new updated versions of software modules on a PC that either isn't turned on or isn't connected to the network. This lack of control greatly complicates the management task of continuously monitoring and tracking the various versions of software modules installed on all the different platforms connected to an organization's computing network.

One way to simplify the task of version control and configuration management begins by identifying where in an application changes take place most frequently. It turns out that the vast majority of requested changes to an application rarely involve modifications to the visual objects comprising the graphical user interface. Similarly, updates to an application's underlying DBMS data model are very infrequent. Rather, it's the business rules and/or business processes that repeatedly change.

This revelation has led to a new, second generation of client/server systems that are built based on a 3-tier model. With the 3-tier model, as shown in figure 3, an application is divided into three components:

1) a presentation layer
2) an application layer
3) a data layer

Essentially, 3-tier takes the fat client's commingled graphical user interface (GUI) and business logic and separates them into distinct modules. The primary advantage of introducing an application layer as a bridge between the client GUI and the server database engine is to minimize the cost and complexity of software maintenance. In the 3-tier model, volatile business logic is maintained separately on its own secure application servers. This makes it dramatically easier to modify application software code without updating a large number of individual desktop platforms.

A second major problem exhibited by fat client applications has been very poor scalability: Performance degrades rapidly as the number of users and the volume of transaction traffic increases. There are a couple of reasons why this happens.

First of all, fat clients require that numerous small messages be communicated between the desktop GUI and the back-end DBMS. Look, for example, at a simple debit/credit transaction. Using the fat client model, a PC must begin by sending a message to the server issuing a request for the debit record. The server must then send back a message after retrieving the debit data. Next, the client must request the credit record. Again, the server must return a message containing

the credit data. The PC must then transmit two subsequent messages to the server to update the debit record and the credit record. Finally, the PC client must send a message instructing the server to commit the transaction. The server responds with an acknowledgment.

This simple example of a debit/credit transaction requires the transmission of multiple distinct messages between the client and the server. So what's the problem? Most LANs are based on either Ethernet or Token Ring technology. Both depend on a contention-based access method for sharing bandwidth. As the number of users connected to the network increases, and the volume of messages that need to be transmitted over the network increases, the amount of time an application must sit in a queue and simply wait for access to the network also increases. This occurs each time the application needs to transmit a message. So what's the solution? Decrease the number of messages that need to be transmitted. That's precisely what the 3-tier model of application partitioning provides.

With 3-tier, the application developer issues a single request from the GUI client to a back-end debit/credit application server. Because the database server is usually executing on the same machine as the application server, the only additional message that must be transmitted back across the network is the final acknowledgment that the transaction has been completed.

A second aspect of the client/server scalability problem is visually portrayed in the top portion of figure 3. It deals with the problem of managing connections between clients and servers. As the number of clients and the number of servers grow, the number of connections between them grows. The left-hand side of the diagram in figure 3 depicts a 2-tier approach. Notice how the number of connections between clients and servers grows exponentially. If you have N clients and M servers, you'll need to manage N x M connections. Contrast this scenario with the 3-tier model presented on the right-hand side of the diagram in figure 3. In this case, the middle tier represents a distributed transaction processing (DTP) monitor, such as Encina, CICS or Tuxedo. Essentially, the DTP monitor acts as a transaction router. By providing a transaction routing service, the DTP monitor significantly decreases the number of connections required between clients and servers. Network expansion follows an arithmetic growth curve instead of a geometric explosion. Because of transaction routing, if you have N clients and M servers, you'll need to manage only N + M connections.

The advantage of 3-tier over 2-tier is compelling in a large-scale enterprise client/server environment. Furthermore, a secondary benefit of the 3-tier model is its ability to increase availability, reliability and manageability. With DTP monitors, application servers can be replicated to increase availability and performance, including automatic load balancing and restart of failed application servers.

Object-Based and Object-Oriented

As computing leaped from the data center to the desktop, the very essence of applications changed dramatically. Instead of simply automating existing operational business processes, new applications, such as desktop publishing, have enabled knowledge workers to do more with less – and do it more effectively. This new wave of applications technology was designed to handle significantly more complex types of data than simply numbers, character strings and dates.

Historically, computing has evolved along two dimensions:
1) data and
2) processing.

Ever since von Neuman in the 1940s, computer hardware has been designed with a main storage memory that holds both data and process (i.e., program). Software designers – the folks responsible for creating the programs that execute on top of the hardware – have continuously striven to increase the levels of abstraction in which developers deal with both the data and the processing dimensions.

By the 1980s, the abstraction for the data dimension had matured to the level of entities and relationships (also known as the ER model). Advances in the level of abstraction along the process dimension had led to the development of structured programming concepts. During the past decade, we have continued to witness ever higher levels of abstraction along both the data and the processing dimensions, resulting in a new paradigm referred to as object computing.

In the top portion of figure 4, the data dimension corresponds to the vertical axis and the process dimension corresponds to the horizontal axis. Let's explore how object technology has raised the level of abstraction along both of these dimensions.

Objects represent one of the most significant breakthroughs in our understanding of how to model complex systems. Prior to objects, we had a data model based on entities and relationships and a process model representing a top-down functional decomposition of an automated system. A data model is a computerized representation of real world entities. Examples include employees, departments, customers, parts, suppliers, policies, claims, etc. A major advantage of modeling entities is their lack of volatility (i.e., they rarely change), especially by comparison with process model procedures that constantly change (e.g., every time a company undergoes a business reorganization).

In a conventional system, entities are passive data stores manipulated by active independent procedures. In an object system, entities communicate explicitly.

An object combines an entity's properties (e.g., an employee's name, social security number, date of birth, etc.) with its operations (e.g., hiring an employee, firing an employee, giving an employee a raise, etc.). Encapsulation refers to the hiding of an object's properties within the object itself.

Objects, Components and Applets

OLCP computing can be thought of in terms of black boxes and white boxes (sometimes referred to as breadboarding).

Black boxes are components or applets that correspond to objects with well-defined inputs and well-defined outputs. The simplest are GUI controls, such as text boxes, radio buttons or list boxes, that respond to simple events such as clicking or double-clicking a mouse button. Numerous new and much more sophisticated components and applets are currently being developed based on ActiveX and Java.

Black box objects are essentially canned solutions. Individual components and applets are stored inside class libraries. But finding the right black box object can be immensely difficult. The dilemma is that when developers search the class library, they don't have a solution in hand – they have a problem. How do you search a solution space when you're coming from a problem space? There's a lack of impedance. That's where white boxes play an important role.

White boxes are basically workflow scripts that are triggered by business events. The individual steps comprising the workflows manipulate the black box components and applets. They provide a frame of reference that localizes the portions of class libraries that need to be searched.

Because of encapsulation, the only way one object can interact with another is via its operations. How? By one object sending a message to another object. Associated with each message is a method that defines the step-by-step instructions for carrying out each procedural operation.

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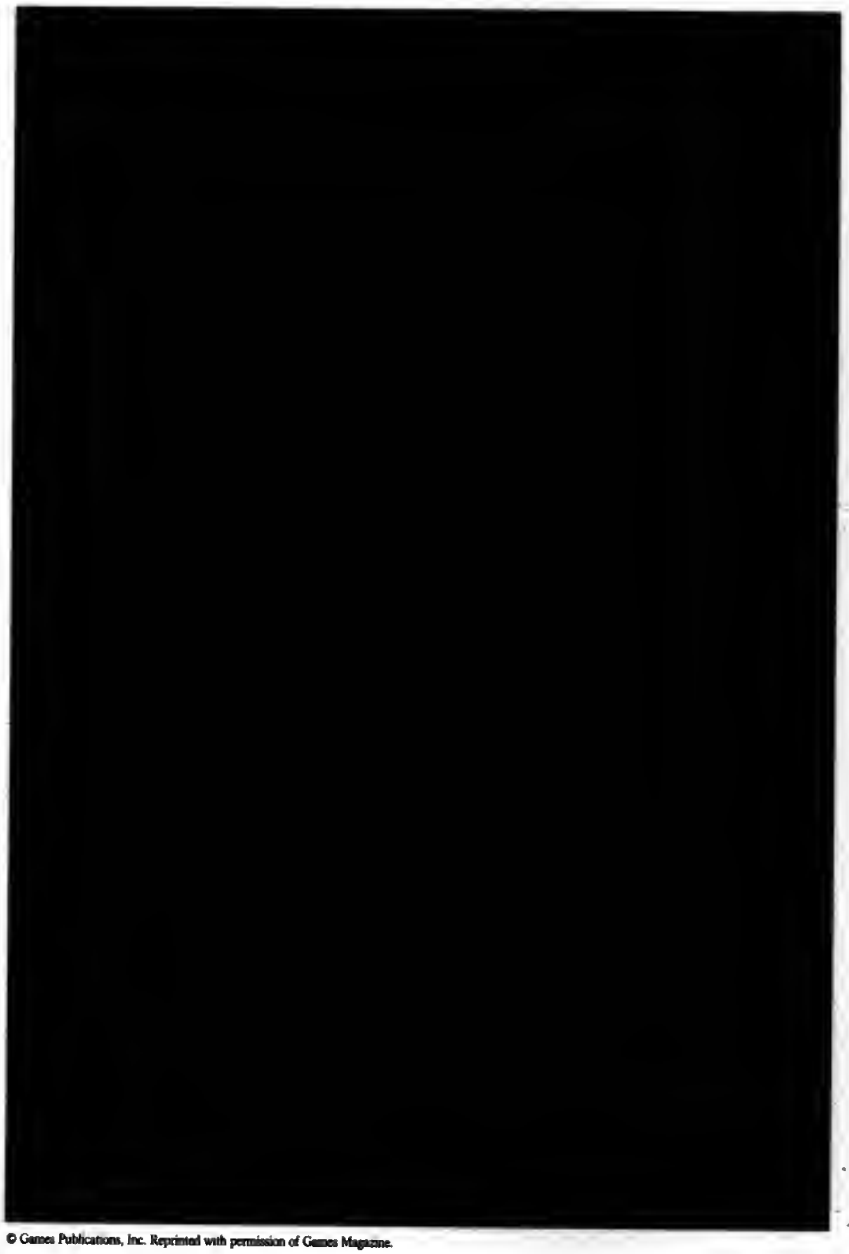

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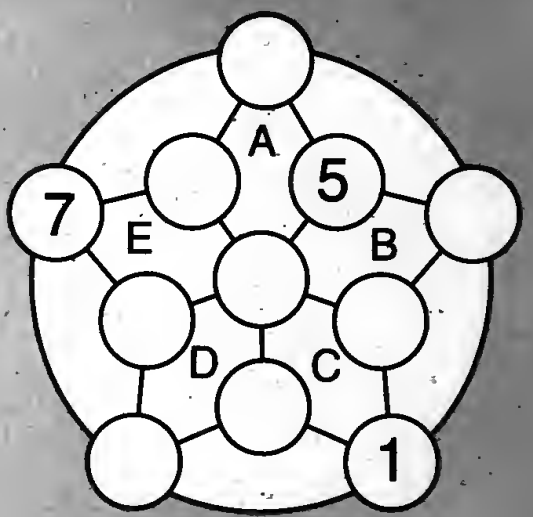
Place the numbers 1 through 11 in the grid so that the total of the numbers in each diamond (A-E), as well as the outer circle, is 25. Three numbers have been placed to start you off.



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As shown in figure 4, object-oriented implies moving to higher levels of abstraction along both the data and the process dimensions. With object-oriented, the objects bundled with the product are referred to as its foundation classes. Developers can create new, user-defined object classes through inheritance. Inheritance uses the concept of subclasses to enable developers to extend generic solutions in order to handle special cases. Specialization is accomplished by allowing new operations to be added or existing operations to be overridden. Inheritance enables developers to build applications according to the way end users express their requirements – by exception.

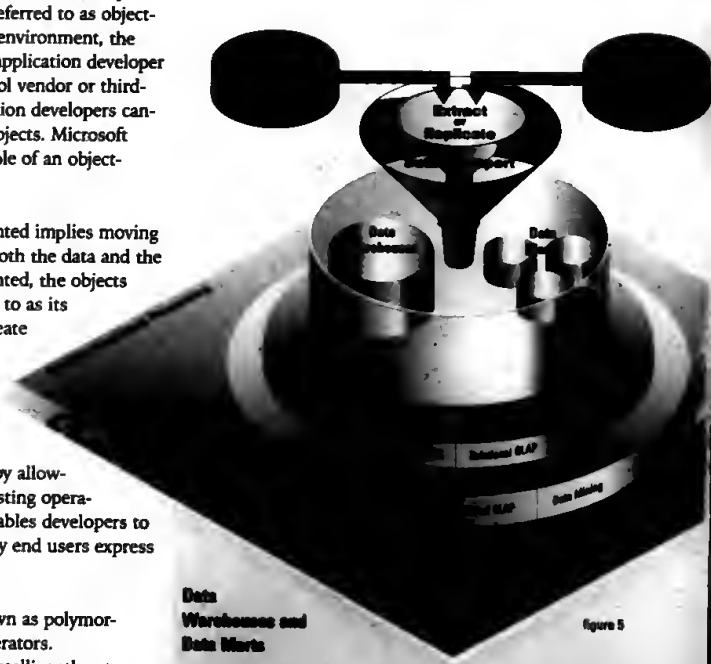
The object-oriented property known as polymorphism supports the overloading of operators. Polymorphism enables objects to act intelligently – to assume responsibility. People use polymorphism all the time in their everyday language. For instance, think about a person's behavior in response to the following polymorphic commands: *Answer the phone; answer the door; answer a letter; answer a question.* People are smart – they'll choose appropriate behavior based on the type of object being answered. In terms of object technology, polymorphism implies intelligence. The object receiving a message knows how to behave based on the action requested. The sender object (i.e., the requester) doesn't need to worry about which behavior is appropriate. The receiver object (i.e., the server) is responsible.

Smalltalk, C++ and Java are representative of object-oriented development environments.

The bottom portion of figure 4 depicts the object model's approach to 3-tier computing. Applications are comprised of three types of objects:

1) visual objects
2) business objects
3) data objects

Associated with each type of object are events.



Data Warehouses and Data Marts figure 5

The primary goal of OLTP and OLCP is the automation of business processes. The driving force behind OLAP is fundamentally different. OLAP is intended to enable better, more timely and more effective business decision-making.

To help provide end users with easy access to accurate and consistent data, information systems organizations have been building data warehouses and data marts. This approach represents a dual database strategy:

- **operational databases for production applications (OLTP and OLCP)**
- **retrieval-only databases for decision support (OLAP)**

The principal reason why a dual database strategy is needed is because there are two distinct measures of time: 1) a point in time, and 2) a time interval.

For OLTP and OLCP, databases define business states. At any specific point in time, the database represents a snapshot record of the business (e.g., a bank account's balance or the number of widgets in an inventory bin). Transactions track the state-to-state transitions caused by business events (e.g., withdrawing money from a bank account or shipping a widget from inventory).

OLAP applications, on the other hand, involve retrieving information. Frequently, these retrievals require examining data across time intervals to be able to identify business trends. For example, how many units of product X were sold in the past month? How do those sales figures compare with last month's? How do they compare with the same month a year ago?

Data warehouses and data marts represent time series of extracts (i.e., snapshots of data built up as time layers) from either production databases or external information sources. The difference between a data warehouse and a data mart is simply one of scope. A data warehouse reflects a top-down enterprise strategy, while a data mart represents a bottom-up approach targeted at the departmental or workgroup level.

The top portion of figure 5 graphically depicts the process of extracting, scrubbing (i.e., cleaning), transforming and transporting data from one or more operational systems or external information sources into data warehouses/data marts. The data itself is subject-oriented, nonvolatile and time-variant. Generally, both detailed and summarized data is maintained.

In essence, you should think about data warehouses and data marts as simply the electronic equivalent of all those hard-copy printed reports that for so many years have been spewing forth from line printers and being distributed to end users. Of course, where OLAP really makes a huge difference is with the easy-to-use tools that make it fast and simple for end users to readily access their information.

Integrating Multiple Heterogeneous Sources

One of the major benefits of data warehouses and data marts is their ability to provide access to accurate and consistent data that is integrated from multiple heterogeneous sources. What makes integration difficult is that the same data is often represented differently in different legacy systems. Since the data warehouse is read-only and nonvolatile, the legacy data can be integrated and made consistent during the data extraction, data scrubbing, data transformation and data transport process. But there are other applications, such as customer service, where integration and consistency are needed, but for use with volatile, operational data.

Customer data is generally scattered across numerous legacy applications. For example, customer data might exist in the following systems:

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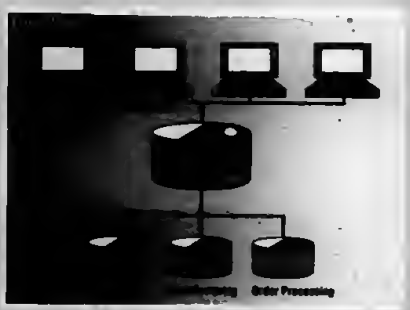

The best technical solution for providing integrated and consistent customer data from all of these operational legacy applications is to create OLCP-like classes of objects that effectively wrap OLTP legacy applications. These wrapped legacy components can then be combined and manipulated in exactly the same way that developers work with other components and applets.

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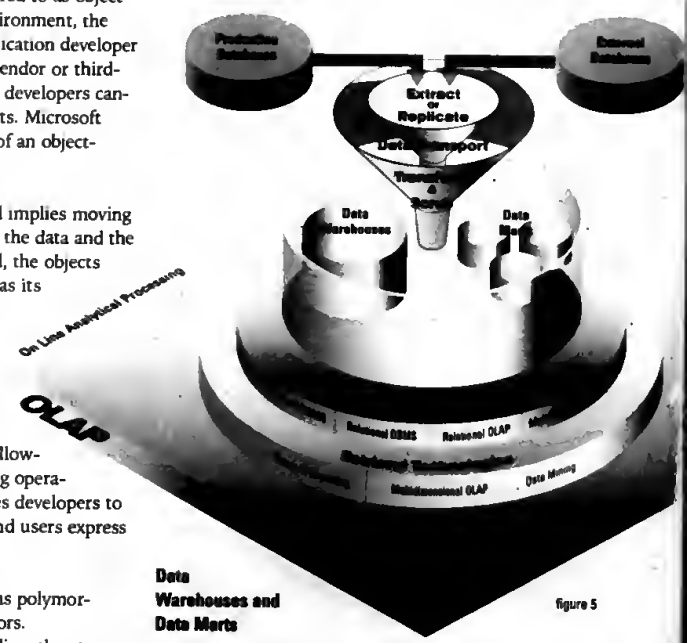

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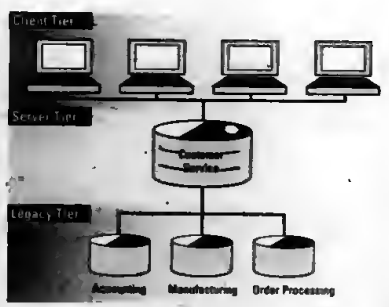

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OLAP data is physically stored in either a relational DBMS or a multidimensional DBMS. Data warehouses and data marts can frequently grow from a few gigabytes up into the terabyte-size range. End users can also usually access their operational data directly using a variety of middleware products.

As shown at the bottom of figure 5, there are three fundamentally different types of OLAP applications commonly used to access data warehouses and data marts:

1) query and reporting
2) multidimensional analysis
3) data mining

Query and reporting tools allow end users to easily generate their own reports and charts while simultaneously enabling IS to retain control over critical data access activities such as security.

Multidimensional analysis products provide facilities that make it fast and easy for analysts to drill down from summary-level views of data to detailed data or to roll-up from detailed data to consolidated summary views. Multidimensional analysis tools help analysts quickly identify trends by enabling them to easily slice and dice their data to shift perspectives.

For both query and reporting, as well as for multidimensional analysis, the end user drives the process of extracting information from the data warehouse. Sometimes, though, users don't necessarily know what it is they're searching for. What's really needed, instead, is an automated process that can go off and discover underlying patterns hidden within the data. The automatic discovery-driven extraction of previously unknown information is commonly referred to as data mining.

Modeling Aboveware

Our discussion of Aboveware began by observing that: 1) tools shape the solutions; 2) problems get defined in terms of available solutions; and 3) there's no single universal software development tool because there's no single universal type of software application. Equally powerful is the idea that all three types of Aboveware have their own unique modeling requirements. In other words, an OLTP enterprise model will be different than an OLCP enterprise model, which will be different than an OLAP enterprise model, even though all three are modeling the same fundamental set of underlying business entities.

Data models designed for OLTP applications are built based on the rules of data normalization. According to normalization, the overriding objective of database modeling is to minimize data redundancy. The normalization process begins with the first normal form requirement that all repeating groups be alliminated. Second and third normal forms ensure that all many-to-many and one-to-many relationships among different entities are properly accounted for, respectively. The ultimate design goal is to create a data store in which each fact is recorded once and only once. With normalized data models, associated data can be combined at runtime using a database join operation. This enables any one-to-one, one-to-many or many-to-many relationships among various entities to be easily accessed from within an application.

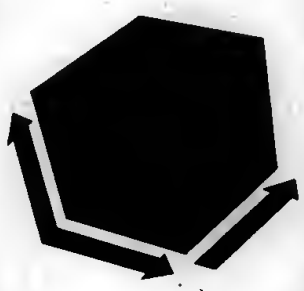

figure 6

Note that normalized databases are highly optimized for updates (i.e., adds, deletes and changes). Retrievals, on the other hand, especially those requiring multiple table joins, will frequently perform poorly in a highly normalized database environment. Of course, this isn't a problem for OLTP because most OLTP applications are primarily intended to perform

lots of simple updates. The most important requirement for OLTP is to ensure the highest degree of data integrity possible. The worst thing imaginable for OLTP would be the presence of inconsistent, redundant data.

An OLCP model will obviously resemble its OLTP counterpart. After all, both need to reflect an organization's entities and relationships. But there is a major difference. OLTP applications depend on relational DBMSs for their data store. Relational technology can easily model entities and relationships. However, OLCP applications depend on object technology. While an object model can accommodate one-to-one, one-to-many and many-to-many associations, it can also represent a different type of relationship called an aggregation. Aggregations describe composite objects: objects made up of other objects. The aggregation relationship ranges from a whole (e.g., a compound document) to a part (e.g., a table of contents, chapters and an index). A bill of materials is a wonderful example of an aggregation relationship. There is no simple way to represent a bill of materials in a relational data model. A programmer must write the navigational logic to perform part implosions and explosions.

Aggregation is an example of what is known as the closure property. Closure is phenomenally powerful. The very first time I can remember learning about closure was way back when I studied integer algebra. I was taught that if you add two integer numbers together, the sum is always another integer. I was also always impressed by the closure property provided by the relational data model. If you take two relational tables and join them together, what do you get as a result? A relational table. The closure property supported by the object model's aggregation relationship enables one object to be embedded inside another object. Embedding objects inside other objects enables software developers to hide all kinds of implementation complexity.

Because an object model supports aggregation and a relational data model does not, the two models are guaranteed to be different by definition. The ability to handle aggregation relationships is one of the key features provided by object-oriented DBMS products.

Most RDBMS vendors are currently evolving their systems into universal servers in order to be able to handle the requirements for supporting aggregation (and other object model features). Currently, if an object-oriented OLCP system uses an RDBMS for its data store, then a programmer must write mapping software that can translate between the application's object model and the database's relational model.

Dimensional Modeling

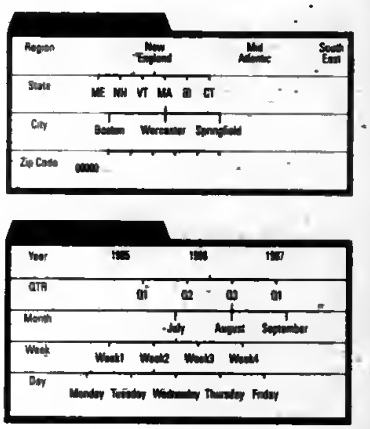

figure 7

The data model needed for OLAP requires yet another database design. To start with, the primary purpose of OLAP applications is to allow end users to perform their own ad hoc database queries, generate reports and graphically chart data. The third normal form data models developed for OLTP applications deliver appalling performance in this retrieval intensive environment. At a minimum, data must be denormalized to speed up database retrievals. In essence, query performance is improved by storing redundant data. Since the data is read-only, integrity is not an issue.

One of the key objectives of OLAP is to facilitate business analysis. The key to analysis is to provide support for comparisons. The best way to accomplish comparisons is through a different kind of data model known as multidimensional. A multidimensional data model is a hypercube that contains some numeric

data describing a business metric, such as sales, budgets, inventory, market share, etc. Each metric exists within the context of dimensions, such as time, geography or product type (see figure 6). Moreover, the separate dimensions are themselves typically described by hierarchical attributes (see figure 7). End users analyze their data by drilling down and rolling up through these dimensional hierarchies or by slicing and dicing in order to examine subsets of their multidimensional hypercubes. There's a class of multidimensional DBMS products specifically designed to facilitate OLAP data access. Alternatively, there's another set of tools available known as relational OLAP, or ROLAP, that enable end users to drill down, roll up and slice and dice against data stored directly in an RDBMS.

The most important message is to understand there is no single, universal model that can describe an organization's information needs. Multiple models are required. The situation is analogous to a building architect's design blueprints. For example, if an architect were designing a house, there'd be one set of blueprints for the carpenters, another set for the plumbers and yet another set for the electricians. With Aboveware, you'll need one information model for OLTP, another for OLCP and yet another for OLAP. They are all related in that they're all modeling the same enterprise. On the other hand, they are all different because they're attacking different information issues.

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The Road Map Series

The Road Map Series was created by Jeff Tash, president of Database Decisions, a division of Hewitt Associates, LLC. Database Decisions specializes in an approach to information technology consulting we call *gestalt computing*, which literally means the whole is greater than the sum of its parts. The Client/Server Road Maps are just one example of this philosophy. They present very complex technical material in an easy-to-understand manner that puts everyone on the same page.

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(800) 381-7515

Through consulting and lecturing, Database Decisions helps businesses adapt to new technologies by establishing realistic goals and visions that can be shared by both IS professionals and the end user community.

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95 Sawyer Road, Suite 600
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Briefs

Frame-relay help

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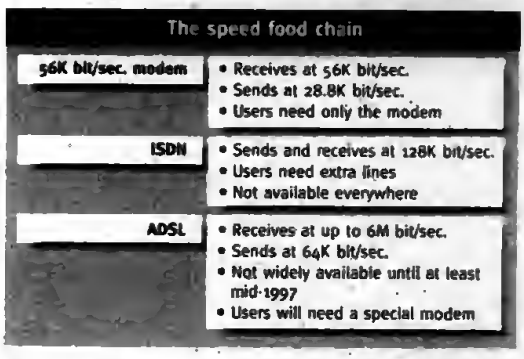
Juiced modems rival ISDN as the link of choice

By Kim Girard

Faster modems slated to arrive next year will provide an interim alternative to ISDN while users wait for even faster technologies — cable modems and ADSL — to reach the market.

New 56K bit/sec. modems from several vendors promise double the speed of 28.8K bit/sec. models.


The speed food chain
56K bit/sec. modem
• Receives at 56K bit/sec.
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• Users need only the modem
ISDN
• Sends and receives at 128K bit/sec.
• Users need extra lines
• Not available everywhere
ADSL
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• Sends at 64K bit/sec.
• Not widely available until at least mid-1997
• Users will need a special modem

That is still slower than the 128K bit/sec. of Integrated Services Digital Network (ISDN), but the spread of ISDN has been limited by several factors.

ISDN requires new telephone lines, is subject to wide price variations depending on where the user lives and simply isn't available in many areas.

"There are a lot of installation hassles with ISDN," said Bill Butler, president of Telelink Corp., an independent service provider in Nashville. "It's supposed to be flexible, but you need different setups for telephone, videoconferencing and data."

The new modems will enable users "to taste how pleasant it is" to cruise the World Wide Web at double-speed and "whet their appetite for the real deal" of Asymmetric Digital Subscriber Line (ADSL), said Kieran Taylor, broadband analyst at TeleChoice, Inc., a consultancy in Verona, N.J.

With ADSL, a user can use regular copper phone lines to send data at 64K bit/sec. and receive it at speeds of 1.5M bit/sec. to 6M bit/sec. ADSL is 200 times faster than analog access and 90 times faster than ISDN.

Although many carriers are conducting ADSL trials, none has deployed the service on a large scale.

"It's a great interim path until ADSL or anything else becomes available," said Ernie Raper, a senior market analyst at Vision Quest, a marketing consultancy in Moorpark, Calif.

"Once this gets out there, within a 12-month period, you will see it become the modem of standard," Raper said.

He said the modems should have a life cycle of about three to four years before ADSL and cable modems hit the mainstream.

Search for speed

U.S. Robotics Corp. recently announced its X2 line of 56K bit/sec. products and outlined a plan to upgrade users.

With the new modems, users can send requests for information on copper lines, and then independent service providers blast data back on higher-speed digital links.

One user taking a wait-and-see attitude was Gary Troutman, corporate development director at Georgia Institute of Technology in Atlanta.

Modems can provide a great interim path until ADSL or anything else becomes available.

"The proof is in the pudding," he said, adding that he is always looking for more speed. "I need to try it and see how it works."

But one analyst was skeptical of the 56K bit/sec. technology — and all tools to boost online access.

"I don't think you'll find people standing out on the sidewalk waiting for the modem to come by because they'll soon hear from their peers that the functionality doesn't deliver," said Joanne Pratt, a telecommuting consultant in Dallas.

Users need better phone lines and service, Pratt said, not better modems.

U.S. Robotics will offer customer modem upgrades in January and modem pool and access server upgrades in February.

Lucent Technologies, Inc., Rockwell International Corp. and Motorola, Inc. also intend to offer 56K bit/sec. products next year.

Modems initially are expected to cost $100 to $200, with prices dropping within a year to $100, according to Raper.

Jury still out on Windows NT 4.0

CONTINUED FROM PAGE 53

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"As a precaution, though, I'm going to wait until after this first Service Pack has been out before I deploy [Release] 4.0 on my production networks," Merrick said.

Smooth operator

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"We're very pleased. Windows NT 4.0 has lived up to our expectations," Stein said.

EDS will oversee the rollout of Windows NT Server 4.0 to 8,500 General Motors Corp. automobile dealerships nationwide, he said.

But some users said they have uncovered some flaws.

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Operating systems

"We have to do more troubleshooting, but I suspect it's either my SCSI adapter or video card," he said.

The company teaches a wide range of classes involving Windows NT and Windows 95 and helps its customers set up their networks.

Ron Milione, professional services technical manager at Systron, Inc., agreed.

Systron is a systems integrator and Microsoft platinum reseller in New York that counts dozens of Fortune 500 firms among its customers. As a large Microsoft reseller, Milione said he routinely gets Windows NT alpha and beta software well in advance.

"Most of the bugs that I've seen, such as hardware incompatibility issues, installation errors and time-outs involving security parameters, are just sloppy stuff and not major inherent flaws in the underlying operating system kernel," Milione said.

A Microsoft spokesman said the company just released its initial Windows NT 4.0 Service Pack and will "work to resolve other issues in the most timely manner possible."

Don't trip over NT 4.0 hurdles

There are several common stumbling blocks that first-time Windows NT 4.0 users may encounter, according to David Sheridan, a technical instructor liaison at Tech-Teach International, and Ron Milione, a professional services technical manager at Systron. They include the following:

- Error messages may pop up when a user is establishing user access rights to certain files and directories. "It takes longer to log in. But system security isn't compromised as far as I can tell," Milione said.
- There is a lack of documentation for the TCP/IP and Point-to-Point Tunneling networking protocols.
- There is a lack of documentation for the SysDiff and Rollback software installation utilities.
- SCSI controller conflicts may result in system crashes.
- Users have encountered difficulties installing the Exchange Server. Some users reported that the setup kept looping, which prevented installation.
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END STA

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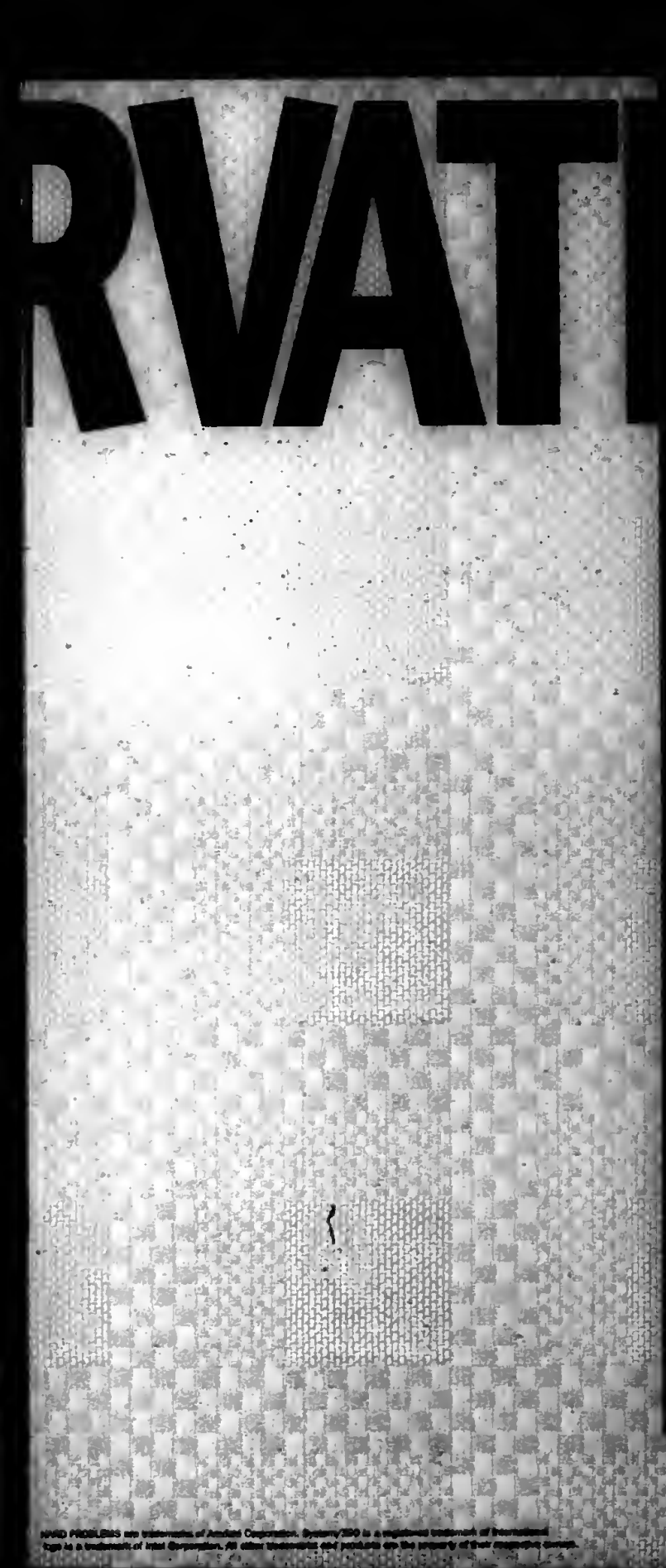

No matter how much you spend establishing your IT infrastructure, your end-user could still be starving for critical information and data access.

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IntraSpection manages network

CONTINUED FROM PAGE 53

"I'm glad to see someone going after the general reporting function, taking an even-handed approach instead of vendors focusing only on their own products," said Bob Childress, a network management analyst at Texas Instruments, Inc. in Dallas.

Large organizations can supplement vendor-specific SNMP consoles that may be costly, complex and confined to the control center, potential users said.

A network analyst at a multistate insurance company, who asked to remain anonymous, said he liked the sound of IntraSpection but said, "We don't have an intranet in place right now to support it."

The prime targets — small to midsize businesses or branch offices — could handle their SNMP monitoring needs through IntraSpection, analysts said.

"The idea of providing free, multivendor management through the Web makes sense because there's a real need to support small and midtier organizations," said Brian Burba, a management analyst at International Data Corp. in Framingham, Mass.

But Asante may not be the company to drive such a de facto standard, Burba said. Free distribution modeled after Netscape Communications Corp. will catch attention, but follow-through will be essential, he said.

Management software isn't a core competency for Asante, Burba said, so "jumping from managing your own hardware to everyone else's is a major transition."

The San Jose, Calif., vendor must quickly deliver modules for mainstream gear and get others to write applications for IntraSpection, he said.

The broad support crucial to successful penetration of IntraSpection won't come from internetworking leaders, but it could come from smaller vendors who take advantage of IntraSpection to deliver detailed views of their products, said Greg Howard, an analyst at Infonetics Research, Inc. in San Jose.

Briefs

Legato tackles big backup

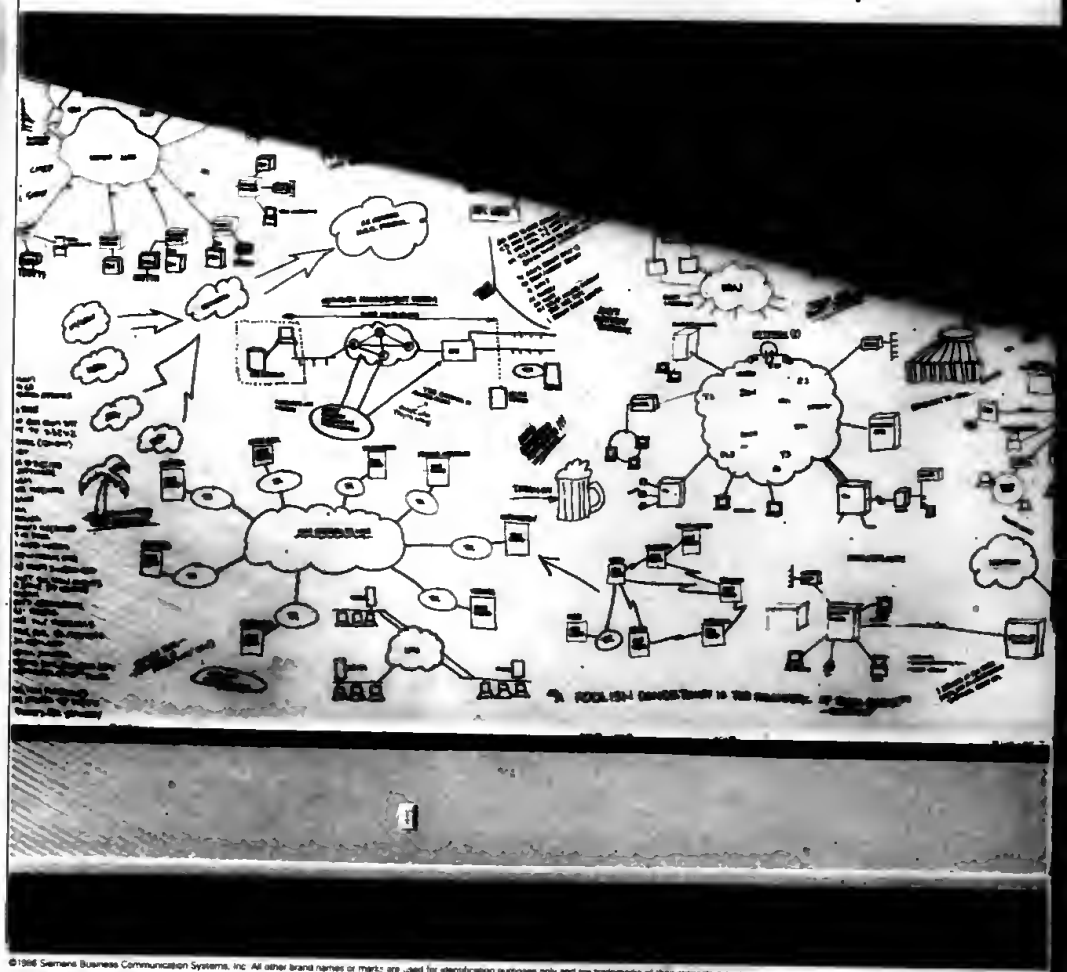
Legato Systems, Inc. in Palo Alto, Calif., last week upgraded its Unix-based backup software with support for enterprise-scale storage devices. The vendor introduced Version 4.2.5 of NetWorker for Unix, which runs on IBM's AIX and Sun Microsystems, Inc.'s Solaris or SunOS platforms. Prices start at $6,000 with two options available. The Silo Support Module lets users take advantage of Storage Technology Corp.'s Automated Cartridge Storage Library Subsystem or EMASS, Inc.'s DAS. One or more NetWorker servers can attach to the silo or library along with a mainframe, other applications and other Unix servers. This option costs $9,500 for up to 128 volumes or $30,000 for unlimited volumes. The High-Speed Device Support Module costs $6,500 per server.

Testing software added to Network General suite

Network General Corp. this week will add network performance testing software to its Total Network Visibility line of management tools. Network General in Menlo Park, Calif., will sell and support Chariot from Ganymede Software, Inc. in Research Triangle Park, N.C. Chariot can help network managers perform customized, repeatable tests to verify the performance of a network or gauge the load of a client/server application. Pricing starts at $9,000.

SIEMENS

Handling the complexities of your telecommunications system is a lon



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New Products

Network Peripherals, Inc. has announced three NuCard Fiber Distributed Data Interface (FDDI) Sbus network adapters for Sun Microsystems, Inc.'s Ultra systems and Netra servers.

According to the Milpitas, Calif., company, the FD-450 series includes a single-attach Sbus multimode fiber card, a dual-attach Sbus multimode fiber card and a single-attach Sbus unshielded twisted-pair (UTP) card. They were designed to give users high-speed connectivity — up to 100M byte/sec, among servers, workstations and segments.

Pricing starts at $995 for the UTP card; $1,995 for the single-attach card, and $2,995 for the dual-attach card.

▶ *Network Peripherals*
(408) 321-7300
www.npix.com

Platinum Technology, Inc. has announced Netcessities, a development tool set to model, build, test and deploy enterprisewide intranet applications.

According to the Oakbrook Terrace, Ill., company, Netcessities is an open tool set, so developers can include outside technologies or tools.

Among the tools included in the set are Paradigm Plus for object-oriented design; ObjectPro, which uses C++ code generation, and Final Exam, an automated testing environment.

Pricing for Netcessities starts at $2,995.

▶ *Platinum Technology*
(630) 620-5000
www.platinum.com

The Linksys Group's *EtherFast 12-Port Stackable 100Base-TX Hub*

The Linksys Group, Inc. has announced EtherFast 12-Port Stackable 100Base-TX Hub for network operating systems.

According to the Irvine, Calif., company, the 12-port hub allows a maximum of five other stackable hubs to be directly linked together.

Pricing starts at $1,799.

▶ *Linksys Group*
(714) 261-1288
www.linksys.com

Acclaim Communications, Inc. has announced EtherWAN, a family of network switches that fuse switching with routing.

According to the Santa Clara, Calif., company, EtherWAN supports as many as 24 100M-bit ports and wide-area network interfaces.

Included in the family of switches are Acclaim 1024-2ES, which offers 24 10M-bit switched Ethernet ports, two 100M-bit switched Ethernet ports and an optional WAN interface; and Acclaim 2024 FES, which offers 24 10/100M-bit switched Ethernet ports.

Pricing for Acclaim 1024-2ES starts at $4,995.

Pricing for Acclaim 2024 FES starts at $14,400.

▶ *Acclaim Communications*
(408) 327-0100
www.acclaiminc.com

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starting at $3,995

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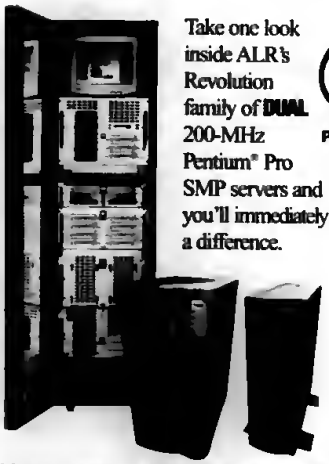

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Networks come in all shapes and sizes, and so do these dual processing Revolution servers.

Dual processor ready! Meaning, these systems deliver enterprise class power for the price of a departmental server.

But dual processing isn't all that sets these systems apart. DUAL redundant power supplies.* DUAL PCI bus technology. Error checking and correcting memory. One-Gigabyte system memory expansion. Numerous hot-spare storage subsystems and RAID solutions. And with both tower and rack-mountable configurations, these systems are ideal for a variety of network applications. Plus, ALR's "built-in" InforManager server hardware management provides the security you need to protect your sensitive, mission critical operations.

And if you need even more power, ALR's award-winning family of **QUAD** processing Revolution servers delivers the highest level of performance available on the PC platform to date.

Even ALR's service and support exceeds the norm. All these systems are backed by a 5 year/36 month warranty with a full 3 years of free on-site service. That's more the twice the coverage of most competitive systems.

With a choice of single or dual processing, these servers have the power you need at a price you can afford.

Seeing is truly believing. So, for the location of the ALR reseller nearest you, call: **1-800-444-4ALR** *(ref# 5805)*

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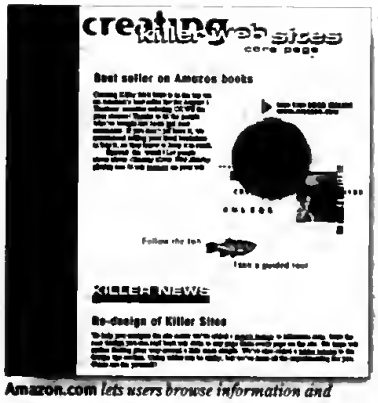
* Rackmount and Revolution MP Pro come standard with redundant power supply, optional on Revolution DUALS.

ALR is on the Internet - http://www.alr.com, *CompuServe* - **GO ALRINC,** *& America Online* - **Keyword ALR** Advanced Logic Research, Inc. 9401 Jeronimo, Irvine, CA 92718 (714) 581-6770 FAX (714) 581-9240. Prices, configurations and specifications subject to change without notice. Systems shown with optional equipment. Pricing based on U.S. dollars. ALR is a registered trademark of Advanced Logic Research, Inc. Pentium logo trademark used under license from Intel Corporation. All other brand and product names are trademarks or registered trademarks of their respective owners. * Some restrictions apply; contact ALR for complete details. © 1996 by ALR

The Internet



Amazon.com *lets users browse information and sells books at a discount*

Most 'net sites aren't useful, critics say

By Matt Hamblen

A lot of businesses are setting up shop on the World Wide Web, but many critics find the majority of sites ineffective in tapping the commercial potential of the Web.

Webmasters should worry less about the technology of the Web and concentrate on giving surfers reasons to buy and reasons to return to a site, observers said.

"It takes less than two hands now to count the really great business Web sites," said Stan Goldberg, director of software strategy service at Forrester Research, Inc. in Cambridge, Mass. And yet Goldberg said he is "very keen on the Internet as a business medium." The emphasis lately has been on quality-graphic design, animation and streaming audio and video — not on sales.

Internet commerce

"People using the Web don't give a damn about technology. They care about value and solutions," said Phillippe Bouissou, director of Internet commerce and services at Apple Computer, Inc., at a recent Interactive Multimedia Association Expo.

Return business

How does a business create a Web site useful to customers? The key to a good site — such as Federal Express Corp. (www.fedex.com) and Amazon.com, Inc. (www.amazon.com) sites — is to recognize the customer's need for a satisfying visit to the site, said Rick Smolan, a photojournalist who recently created *24 Hours in Cyberspace*, a book and CD-ROM that include generous examples of business uses of the Web.

Useless, *page 62*

Netscape price change may be costly

By Kim S. Nash

Netscape pricing is getting more complicated.

As part of a series of new products and strategic changes meant to help the company compete with chief rival Microsoft Corp., Netscape Communications Corp. recently outlined plans to charge by the user on four of its new SuiteSpot 3.0 servers. The products will ship in the first quarter next year [CW, Oct. 21].

Pricing remains the same for the Navigator browser, which is part of a bundle of client-side packages called Communicator.

And some SuiteSpot servers won't have per-user fees attached (see chart, page 62).

The old way

Mike Homer, director of marketing at Netscape in Mountain View, Calif., said the per-user pricing is just one of several options available.

Information systems buyers also can choose the old plan of $995 per server for up to 100 users, Homer said.

But per-user pricing kicks in for shops that want to link more than 100 users to Netscape's Collabra groupware and Messaging electronic-mail servers.

The new plan will likely mean higher costs for large intranets than under per-server pricing.

Netscape officials said the company's pricing plan is similar to those of Microsoft and Lotus Development Corp.

Those vendors have per-user pricing models for their competing groupware products, Microsoft Exchange and Lotus Notes.

The new fees, which harken back to client/server pricing models rather than newer Internet-based models, disappointed but didn't surprise several users.

"While we associate Netscape with the wild and near-free Internet of the past, the reality is they are a business just like everyone," said Dave Lewis, principal webmaster at Pacific Bell in San Ramon, Calif. The new fees probably won't slow plans for large intranets, said Jeremy V. Gross, chief technology officer at Countrywide Home Loans, Inc., a large mortgage broker in Pasadena, Calif.

Countrywide's Jeremy V. Gross *says Netscape's new pricing schemes won't slow plans for large intranets*

"The compelling need for knowledge sharing … and to interconnect [with outside partners] will ultimately override any second-guessing of intra-

Netscape, *page 62*

Web site keeps up with *Times*

By Mitch Wagner

The World Wide Web site for *The New York Times* fits the buttoned-down character of a newspaper that still prints black-and-white photos on page 1.

Other sites on the Web dazzle the visitor with cluttered arrays of brightly colored graphics and herky-jerky animations. But the *Times* site presents readers with a succession of black-and-white rectangular graphics files, laying out the day's news in the newspaper's characteristic blocky headline typeface.

Like the newspaper, the uncluttered Web site is just the simple face on a sophisticated operation. The *Times*, which has had a site on the Web since January, built Excalibur, a custom information systems infrastructure to manage the content on the Web. The organization also is looking into customization features and subscription services.

The custom-made Excalibur system *links the Times Web site to the print edition's servers*

The lack of flashy special effects is not likely to hurt the *Times*, said Melissa Bane, an analyst at The Yankee Group in Boston.

"The key to a news site is simplicity," Bane said. "If you confuse the user once, they're never going to come back. I'm not a believer in putting all the bells and whistles on a news site."

Rather than special effects, the big challenge for the *Times* is the same as that for other news sites on the Web — to make money (see story, page 62).

The Excalibur system was designed to resolve two problems: how to import stories and photos from the proprietary publishing

Newspaper, *page 62*

Useless sites slow commerce

CONTINUED FROM PAGE 61

"Smart companies are figuring out that [the Web] changes the whole relationship with customers," Smolan said. "Audiences want to know what your product will do for [them]."

Amazon, for example, offers information about 1 million book titles and lets users order any of them by electronic mail at a discount. Users can register a preference for an author or topic, and they will be notified by E-mail when a relevant new title arrives.

The FedEx site helps users fill out and print a shipping tag and request pickup automatically.

Reply, please

It isn't enough to post a catalog or a Web discussioo forum, Goldberg said. When somebody registers at your site, you oeed to seod an acknowledgement to show that you're listening and perhaps follow up with a notification of a new product in whicb they would be interested.

A company also has to answer E-mail promptly. "The beauty of the Web is that it's interactive, and if you're not going to interact," it won't be effective," Goldberg said. Most companies have ignored that opportunity. A recent study by Matrixx Marketing, Inc. in Cincinnati shows that nearly half of 100 Fortune 500 companies with Web sites polled by Matrixx had no E-mail response capability. Of those 100, only 17 responded to an E-mail inquiry.

One way of giving something to Web customers borrows from the newspaper world.

City Sports (www.citysports.com), a sporting goods chain in Boston, has drummed up business by posting coupons on its site that Web visitors can print out and bring to its stores to save on athletic gear purchases. Shayne Gilbert, president of Silverweave, Inc. in Boston, which created City Sports' Web page, said the coupons bring in regular business. "It amazes me that every retailer is not doing it," he said.

Memo from cyberspace

Rick Smolan created the book "24 Hours in Cyberspace" as a photographic journey through the nether reaches of the Web. He picked up the following insights along the way:

Q: What should corporations do to make their Web sites successful other than use good design or technical tricks?

A: There needs to be a compelling reason to come back every day. ... It sounds obvious, but sometimes sites have a sense of being a ghost ship. There needs to be a really clear feeling to the audience that there is something useful [there].

Q: It's got to be more of an ongoing enterprise?

A: Yes. You need a full-time person [managing the site], and I'd also suggest people don't assign their most junior, expendable person, which is often the case. ... I don't think for a lot of companies it's a high priority. People are just sort of imitating what's out there and [what they end up with] doesn't really apply to their business.

Q: Do you have a sense that very many large companies are creating good sites?

A: I've visited enough sites I didn't like where it was obvious that somebody had not spent a lot of time thinking about it. ... [Designers] think in order to be competitive they need to have spinning icons or Java scripts, and often what their audience wants is a lot simpler than that. Being appropriate is more important than [having] the latest cutting-edge thing.

Q: Is there a danger a company could look too crassly commercial on the Web?

A: I think no amount of money is going to make a Web site interesting or something people would go back to. It's self-governing. If you make it crassly commercial, they won't come back. The successful businesses are people that are thinking differently. ... Art dealers are sharing resources online. ... We featured a family selling hot sauces that went on the Web and now has a worldwide audience for it. It is amazing.

— Matt Hamblen

Netscape's new pricing

Client-side products		
$49 for Navigator, Messenger, Collabra, Conference, Calendar or Composer	Or	$79 for all packages, plus development kit

SuiteSpot 3.0 servers		
$995 for Enterprise, FastTrack, Catalog, Proxy, Messaging, Collabra, Conference, Calendar, or LiveWire Pro	Or	• $3,995 for a bundle of any five of the nine servers • $995 each for Messaging, Collabra, Conference servers only, plus $69 per user*

*Per-user fee is $99 when Communicator client packages are added

Netscape pricing change

CONTINUED FROM PAGE 61

net projects," Gross said. He plans to go ahead with a massive hybrid Internet/intranet applicatioo anchored with Netscape products [CW, Aug. 12].

But IS managers who don't like oew pricing plans for intranet products may have an easier out than in client/server days.

Unlike client/server products that catered to a specific platform or set of proprietary technologies, World Wide Web products are built on established, public standards.

That makes them easier to swap — at least io theory, said Steve Whan, corporate webmaster at BC Hydro and Power Authority, an electric utility in Vancouver.

"As long as iotranet computing is standards-based, I have options for alternatives," Whan said.

Every part of the system can be replaced, said Nina Lytton, an analyst at Open Systems Advisors in Boston.

"You can always find a second source," she said.

Senior editor Mitch Wagner contributed to this report.

Newspaper links Web site with print edition

CONTINUED FROM PAGE 61

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So the IS staff had to find a way to tap into the text on the Atex system without jeopardizing production of the print publicatioo.

Producers import text files to Excalibur's IBM RS/6000 server through a custom-built gateway that runs on Apple Computer, Inc. Macintosh systems.

Excalibur producers view the master text in Web browsers and add Hypertext Markup Language code to publish it to a Web site. The original text files remain protected on the Atex system.

The interactive edition's editors have full access to all Atex servers, which lets them browse through the print editioo before it hits the presses. It would have been easy for the producers to download files from the Excalibur servers, work on them locally and upload the results to the Web site. But that wouldn't have allowed the *Times* to maintain version control and keep track of file locations, Graboske said.

Where's the cash?

Putting a daily newspaper online might be miraculous enough for some people, but it isn't enough for *The New York Times*.

After all, the *Times* is a business. It needs to make money.

Most online newspapers and magazines that distribute their content for free rely on advertising for revenue.

Some, such as *The Wall Street Journal*, are open only to paid subscribers.

But the *Times* plans to broaden its revenue base by offering online searches of its back issues since 1981 for $1.95 per article, said Benjamin Graboske, group director of systems and software design at The New York Times Electronic Media.

But why should users visit the newspaper's Web site when they can buy the paper for a dollar just about anywhere in the U.S.?

Customization — giving each visitor to the *Times* site a different view of the paper based on that visitor's own interests — could be the key, Graboske said.

Someone interested in financial news will see those stories first, for example.

"You really have to go beyond just 'repurposing' existing content to customize information delivery. It needs to be not just highly tailored, but also provide the user with notification of when news comes in," said Michael Goulde, an analyst at Patricia Seybold Group in Boston.

— Mitch Wagner

Useless sites slow commerce

CONTINUED FROM PAGE 61

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But the [illegible]

— Allen Hogue

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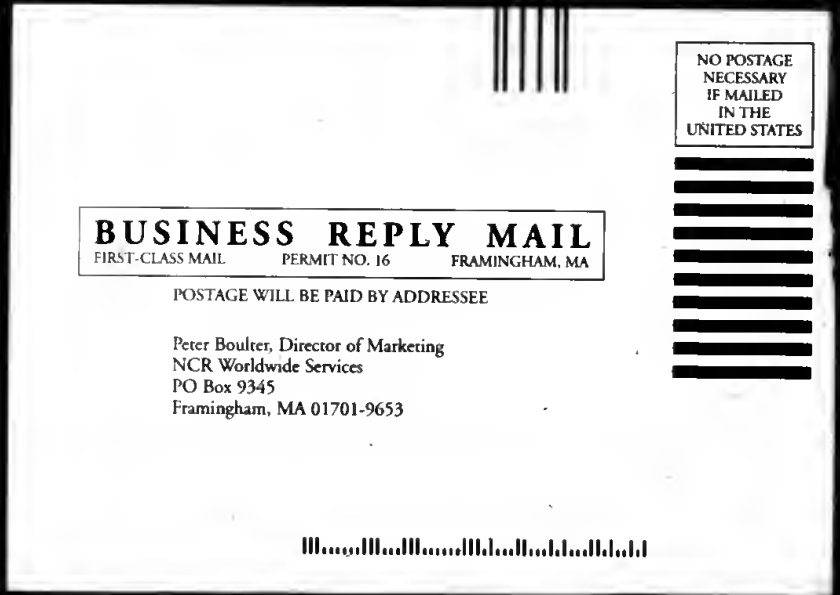

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NCR Worldwide Services
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New Products

Genesys Software Systems, Inc. has announced GenNet, a complete payroll service on the Internet.

According to officials at the Methuen, Mass., company, GenNet lets companies process payroll over the Internet. The product comes in three tiers, including one that provides tax reports and another for tax deposits.

Pricing starts at $2.95 per payment done with GenNet.

▶ *Genesys Software Systems*
(508) 685-5400
www.genesys-soft.com

Information Access Co. has announced AutoSite, a 30,000-page online buyer's guide on new and used cars and trucks.

According to officials at the Westboro, Mass., company, AutoSite customers can be connected to dealers that subscribe to the service to get competitive purchase prices.

Thirty days of unlimited access to AutoSite is available for $9.95.

▶ *Information Access*
(508) 870-5955
www.autosite.com

Artisoft, Inc. has announced Artisoft InfoFast Version 1.0 fax-on-demand software.

According to the Tucson, Ariz., company, InfoFast provides users with 24-hour access to World Wide Web documents and faxes via fax or phone.

It was designed with a drag-and-drop interface and one-button Hypertext Markup Language document synchronization to translate Web pages into faxable images, company officials said.

Pricing for Artisoft InfoEast Version 1.0 starts at $1,995.

▶ *Artisoft*
(520) 670-7100
www.artisoft.com

Farallon Communications, Inc. has announced Netopia Integrated Services Digital Network modems to support Windows and Macintosh users.

According to the Alameda, Calif., company, the product has a serial port speed of 230K bit/sec. and up to 4-to-1 data compression.

The price is $400.

▶ *Farallon Communications*
(510) 814-5000
www.farallon.com

Site Technologies, Inc. has announced SiteMarks, bookmark management software for Windows that provides users with a unified set of bookmarks for Netscape Communications Corp.'s Navigator and Microsoft Corp.'s Internet Explorer browsers.

According to the Durham, N.C., company, SiteMarks allows Navigator to access bookmark files used by Internet Explorer.

SiteMarks costs $29.99.

▶ *Site Technologies, Inc.*
(919) 416-3113
www.sitetech.com

Solutionsoft has announced WordToWeb, an add-in to Microsoft Corp.'s Word Version 7.0 or later that automates the conversion of Word documents to Hypertext Markup Language pages.

According to the Sunnyvale, Calif., company, WordToWeb automatically converts Word graphics to graphics interchange format and can generate thumbnail links for large graphics to minimize download time.

WordToWeb costs $279.

▶ *Solutionsoft*
(408) 736-4013
www.solutionsoft.com

Integrated Micro Solutions has announced TwinTurbo 128M8, a video accelerator for Peripheral Component Interconnect-based Power Macintoshes and compatibles.

According to the San Jose, Calif., company, the accelerator has a 128-bit effective memory bus and 8M bytes of video RAM.

The price is $899.

▶ *Integrated Micro Solutions*
(408) 369-8282
www.integratedmicro.com

There are a lot of factors to consider when you're buying [illegible] SPARC-based servers and workstations. You want power, you want speed, and you want all this performance for the best price. What you don't want is technology that's outdated as soon as it's up and running. And buying a big name is no guarantee of protection.

Luckily, there's a brighter choice. Axil. The Axil Ultimo 1 and Ultima 2 systems feature a full range of UltraSPARC processors and up to 2GB of RAM. Not only that, there's our unique modular chassis design that makes upgrading simple. As technology evolves you can either upgrade your processor, add another for dual processing, or change the motherboard for even faster performance. So you get investment protection built in.

If you want us to shed some light on our servers and workstations, just call 1-800-284-AXIL or visit us at http://www.axil.com. And let us tell you all the reasons we outshine the competition.

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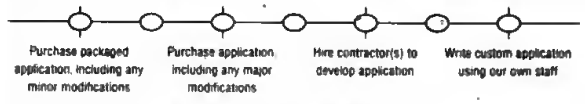
Software Health Check Questionnaire

To provide an accurate analysis of your software environment, we need some information on the applications you use. First, choose a key business application that is in development or has been recently developed. Then, for each of the following questions, select the statement that best describes the software by filling in the circle along the scale. If a question is not relevant, skip it.

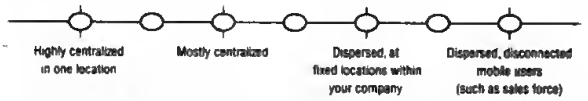
1. Which statement best describes your approach to implementing the application?


Purchase packaged application, including any minor modifications
Purchase application including any major modifications
Hire contractor(s) to develop application
Write custom application using our own staff

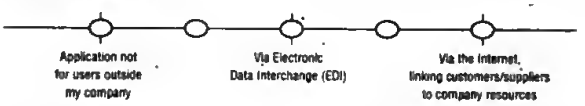
2. How many users will be using the application?_____

3. Within your company, who uses this application?

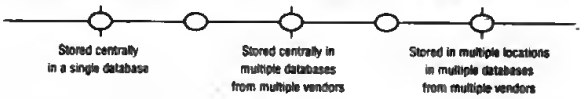
4. How geographically concentrated are most of the users working with the application?


Highly centralized in one location
Mostly centralized
Dispersed, at fixed locations within your company
Dispersed, disconnected mobile users (such as sales force)

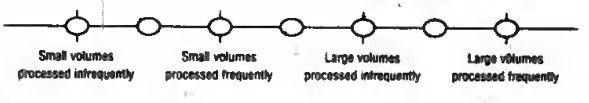
5. In what way will customers and/or suppliers outside of your company work with this application?


Application not for users outside my company
Via Electronic Data Interchange (EDI)
Via the Internet, linking customers/suppliers to company resources

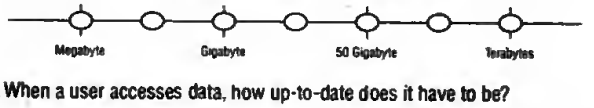
6. How centralized or dispersed is the data used by the application?


Stored centrally in a single database
Stored centrally in multiple databases from multiple vendors
Stored in multiple locations in multiple databases from multiple vendors

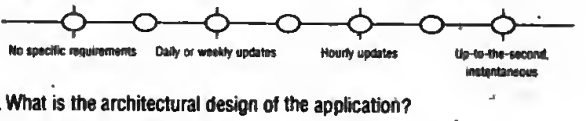
7. What are the characteristics of the data processed by the application?


Small volumes processed infrequently
Small volumes processed frequently
Large volumes processed infrequently
Large volumes processed frequently

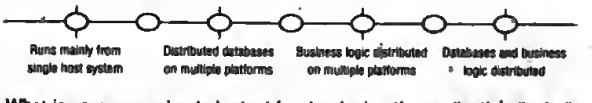
8. What is the size of the database used by the application?



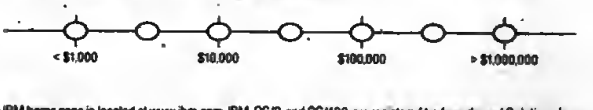
9. When a user accesses data, how up-to-date does it have to be?



10. What is the architectural design of the application?


Runs mainly from single host system
Distributed databases on multiple platforms
Business logic distributed on multiple platforms
Databases and business logic distributed

11. What is your approximate budget for developing the application (including new hardware, software and consultants)?



12. What are the skill levels of the staff developing the application?

Lack necessary skills in required technologies
Some skills in place, additional training and/or new staff required
Staff well-skilled in required technologies

13. What operating system(s) does the application run on or interface with? Check all that apply:

__ IBM (or compatible mainframe OS)
__ OS/400
__ UNIX
__ VMS
__ OS/2 WARP
__ WINDOWS NT
__ WINDOWS 3.1, '95
__ Other _____

14. How many people does your company employ at all locations?

_____

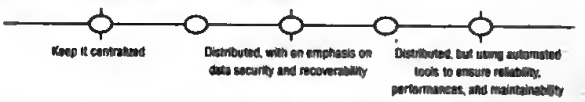
15. What is the primary industry of your company?

_____

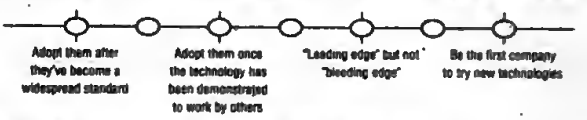
16. Which statement best describes your approach to the reuse of corporate data?

Data tends to be directly related to a single application
We replicate data to support new uses
We provide tools to help users locate data based on its context and meaning
We have implemented or plan to implement a comprehensive data warehouse approach

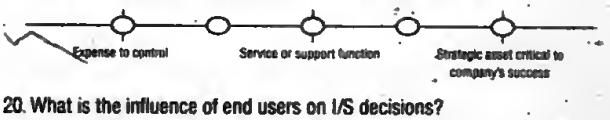
17. Which statement best characterizes your plans for ensuring the integrity and reliability of applications and data?


Keep it centralized
Distributed, with an emphasis on data security and recoverability
Distributed, but using automated tools to ensure reliability, performances, and maintainability

18. How would you categorize your approach to adopting new technologies?


Adopt them after they've become a widespread standard
Adopt them once the technology has been demonstrated to work by others
"Leading edge" but not "bleeding edge"
Be the first company to try new technologies

19. Describe your view of the role of information technology.



20. What is the influence of end users on I/S decisions?

Thank you for taking the time to complete the Software Health Check Questionnaire. Please fax it to us at 1 800 795-9599, or visit us at www.software.ibm.com/is/enterprise/ if you'd like to fill it out on the Web. Please allow two weeks to receive your report.

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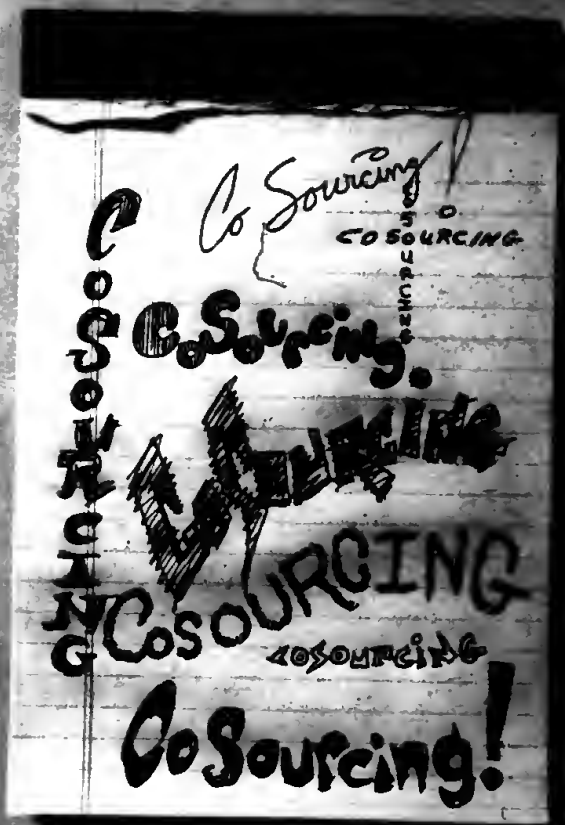

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▶ A [illegible] way of working. EDS

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Auto parts retailer uses Windows NT tool to jump-start a warehousing project, 71

Corporate Strategies

IT to boost resort sales

By Thomas Hoffman

Premiere Resorts' *new property management system was designed to help the company cross-market rooms in its other properties to guests who have stayed at one or more of its resorts, including (from left) The Charter, Whaler's Cove and The Lodge*

Since joining Premiere Resorts International in April, Ken Gay has had little time to schuss the slopes of Steamboat Springs, the Colorado ski area with trails a scant 20 yards from his office.

That's because Gay, director of information systems at Premiere, is a one-man IS crew who has been busy jetting among the property management company's 34 resorts from Colorado to Kauai, Hawaii.

Premiere is installing a centralized property management system from Springer-Miller Systems, Inc. in Stowe, Vt., to help automate reservations processing and put Premiere's guest information to more effective use.

Gay said the software was better designed to utilize customer histories than other systems Premiere evaluated. For example, resorts that used manual reservations in the past had to rely on Premiere's central reservations office to take bookings over the telephone. "Central rez" would fax those reservations to a resort, where front-office staff would reenter the reservations in the existing property management system, Gay said.

With the new IBM RS/6000-based systems, the resorts will be able to accept the reservations themselves, eliminate dual entry and improve productivity by 30% to 40%, Gay said.

Plus, guest history information can be reused to cross-market special events to guests who have stayed at one or more resorts. That is the kind of micromarketing that Premiere wasn't able to do before with a "collage" of computer systems, Gay said.

Outsourcing

Other resorts usually rely on third-party vendors and clearinghouses to crunch guest history data for them, said Robert Langsfeld, principal associate at Langsfeld Fazio & Associates, a travel management consultancy in Incline Village, Nev. But most resorts "have found it cost-prohibitive or resource-prohibitive to do it themselves," Langsfeld said.

Gay said Premiere expects to spend less than $2 million over the next two years to roll out the IBM RS/6000 servers and application software to its 34 properties Springer-Miller is doing the installs. Premiere Chief Financial Officer Tom

Resorts, *page 71*

Target: Electronic spies

FBI beefing up corporate computer security alert program

By Gary H. Anthes
WASHINGTON

The Federal Bureau of Investigation might seem to have its hands full investigating underground militias, exploding airplanes and pipe bombs. But the agency is nevertheless beefing up its efforts to help reduce electronic corporate espionage.

The FBI is expanding a program that currently faxes threat alerts to roughly 10,000 corporate security and law enforcement officials to include 25,000 subscribers, said Jonathan Binnie, chief of national security training at the FBI in Washington (www.fbi.gov).

The service can help users avoid attacks against their information systems and respond to attacks that are under way, the FBI claims. Security experts say many victims never become aware of network intrusions.

FBI Director Louis Freeh *says U.S. allies can use high-tech information 'in competition against U.S. firms'*

Binnie said any company may subscribe to the service, which is part of the FBI's Awareness of National Security Issues and Response (ANSIR) program.

David Starr, chief information officer at ITT Corp. in New York, said he hadn't heard of ANSIR but added, "It's a great idea. I want all the heads-up information I can get, either to respond to a threat or try to avoid it."

Starr said he gets information about threats from several sources, but none from the U.S. government.

Elusive threats

"Computer security is ton intangible for many companies," said Rebecca Duncan, senior analyst of information security at Datapro Information Services Group, Inc. in Delran, N.J. "In a computer crime, nothing may be physically touched; all you may see is your competitor coming out with a product similar

FBI, *page 71*

CIOs swap tips on Web forum

By Julia King

Looking for tips on how to write a comprehensive request for proposals for a new data warehouse?

Need some fast facts on Internet usage for an afternoon meeting with senior management about electronic commerce?

Maybe you're just curious about what your peers at other companies are up to on the intranet front.

Online strategies

Those are the kinds of questions the Cambridge Information Network (CIN) was designed to answer for senior information technology strategists (www.cin.ctp.com).

Launched last week by Cambridge Technology Partners, Inc., a systems integrator in Cambridge, Mass., the free Internet-based service provides a forum for chief information officers and other CIN members to discuss technology and business issues.

Becoming a member involves completing an online registration form, which takes about three to four days to process.

"Basically what we're looking for are people who are responsible for the strategic delivery of IS," said CIN publisher and founder Paul McNabb. About 50 people — mostly CIOs, vice presidents of networking and directors of application development and delivery — logged on during a monthlong beta period, he said.

Visibility

What Cambridge Technology Partners gets out of the service is plenty of exposure and an increased potential for future business.

CIO forum, *page 71*

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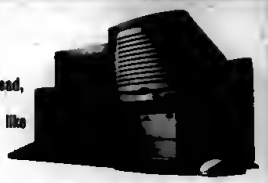

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Resorts

CONTINUED FROM PAGE 69

Ptach expects the system to pay for itself three years after all the servers and sites are installed.

Premiere has been on a spending spree in the past few years. It acquired Deer Valley Lodging Co. in Deer Valley, Utah, in June 1994 and bought seven property management companies in Sun Valley, Idaho, in April 1995. With those acquisitions came a variety of computerized lodging systems that weren't all automated, Gay said.

To find an automated property management system that met user requirements at different resorts, Ptach put together a team of end users from several hotels before Gay came on board. Gay said that strategy helped him gain immediate buy-in from users "and a true sense of ownership" on their part.

Jodie Gingrass, director of corporate development at Deer Valley Lodging who has been part of that user group, said the team approach has worked well. In the past, a technician would install the software and add a very narrow set of functions, she said. "We found something that works best for all users," she said.

Premiere's user-centric approach is also effective in placing the responsibility on third-party vendors and consultants — and not Gay — to deliver the goals of their contracts. "This takes property management to the next level" of service, said Richard Moore, associate professor of hotel information technology at Cornell University's School of Hotel Administration in Ithaca, N.Y.

Resort secrets

Premiere Resorts, a closely held division of Rentokil Group in London, declined to disclose revenue figures.

CIO forum

CONTINUED FROM PAGE 69

One of the earliest users is Gordon Ebanka, global director of IS at $700 million Tambrands, Inc.

"One of the things I found useful is the networking and sharing insights among peers, especially noncompeting peers," he said.

"The content is also very focused, concise and timely, which is important because I don't have time to read through all of the [technology trade] periodicals," Ebanks said.

The CIN World Wide Web site is divided into four areas — peers, experts, ideas and vendors — which contain information ranging from technology white papers and recent industry conference proceedings to product data from vendors.

The peers and experts areas of the site are interactive. Under experts, for example, users can post specific technology questions, which will be answered by a Cambridge Technology Partners consultant.

Under peers, members can participate in online discussions with colleagues at other firms. A survey of CIOs indicates that could be one of the site's most heavily used features, McNabb said.

"We asked IS professionals where they go when making big purchasing decisions, and the big answer was peer referral. The value of CIN to the IT community comes not only from information but from insight and perspective from their peers," he said.

CIN is an example of how Internet services are moving increasingly toward delivering "people and perspective, rather than just content," said Stan Lepeak, an analyst at Meta Group, Inc. in Stamford, Conn.

Auto parts retailer cranks up replication

Windows NT tool organizes data for real-time access

By Tim Ouellette

When Marc Dorais needed to jump-start an AS/400 data warehousing effort at United Auto Parts, he turned to a Windows NT-based replication tool.

Data warehousing

The tool let the Montreal auto parts retailer phase in less-expensive Windows NT servers to handle AS/400 database queries. It also gave decision-makers an organized view of crucial data stored in 450 AS/400s spread across 700 stores and distribution centers.

"We eventually want to have all the stores running on Windows NT," said Dorais, a development manager at United. "But before that, we have to have a way to access the AS/400 data in real time."

Dorais soon will create the first piece of the data warehouse project, a smaller, targeted data mart, which will contain all warranty claims done at United's 11 distribution centers. The data mart will be located on the headquarter's Windows NT server.

United is using Rapid Data, software that replicates multiple AS/400 data files into Microsoft Corp.'s SQL Server tables on the Windows NT server. For example, warranty information stored at the 11 distribution centers is combined in one table that contains historical and current information.

More free time

The SQL Server handles the data calls from there, so the AS/400 is free to process the constant flow of data that comes in from various stores.

"We want to try to install a small NT server to handle all the query requests, so performance of the head office AS/400 will improve," Dorais said. "We don't need to upgrade the AS/400, and the price of a strong NT server is still cheaper than upgrading the AS/400."

And because Rapid Data runs almost completely on NT, Dorais is also freed from hiring developers to program and configure the AS/400, something competing products required. Dorais wanted to focus United's staff expertise on Windows NT because most sites will be running the platform in the next few years, while still accessing data warehouse information stored on AS/400s.

That is a growing reality for AS/400 shops. Analysts said nearly 25% of AS/400 users also have Windows NT machines running in their shops.

By avoiding one CPU-intensive AS/400 function to move data, Rapid Data also saves operators time.

Fewer steps

Because Rapid Data isolates and replicates only the newly changed data, operators don't have to perform AS/400 journaling, which slows down the AS/400, takes up disk space and requires moving data to tape storage each day, Dorais said.

Open Universal Software, Inc. in Montreal will make Rapid Data generally available next month. It will cost between $2,000 and $10,000.

FBI program

CONTINUED FROM PAGE 69

to yours, three months ahead of schedule."

"Foreign intelligence operations directed against U.S. economic interests are neither unusual nor unprecedented," said FBI Director Louis Freeh at a congressional hearing in February. "The end of the Cold War has not resulted in a peace dividend regarding economic espionage."

Freeh said the biggest threat isn't from unfriendly countries such as North Korea.

"Countries traditionally considered allies have infrastructures that allow them to easily [obtain] high-tech information and use it in competition against U.S. firms," he said.

"ANSIR is the FBI's public voice in national security matters — espionage, counterintelligence, economic espionage and physical- and cyberinfrastructure protection," Binnie said.

Binnie said ANSIR faxes alerts about once a month. They may deal with specific threats, offer general security advice or provide special information such as key anniversary dates on which terrorists may launch attacks.

Criminal sanctions

Freeh got his wish for new legal tools against economic espionage two weeks ago when President Clinton signed the Economic Espionage Act. It imposes penalties as high as $10 million and 15 years in prison for the theft of trade secrets. There previously was no specific criminal statute to help the FBI pursue many of the 800 cases of economic espionage by 23 countries under investigation.

Anecdotal evidence suggests economic espionage against U.S. companies is increasing, Duncan said. But because so many computer intrusions go undetected and unreported, it isn't possible to measure the full extent of the problem, she added.

In a recent Datapro survey of 1,337 information security professionals, only 54% of respondents said they had comprehensive security policies, down from 62% in 1992.

Duncan attributed the drop to budget pressures that squeeze out security programs and to moves to decentralize computing.

Tips on avoiding security risks

Ernst & Young LLP in San Francisco offers the following 10 suggestions for companies that wish to avoid losses due to security risks:

- Make employees, vendors and contractors sign confidentiality statements.
- Back up laptops on a regular basis.
- Establish policies and procedures for the use of and downloading of information onto laptops.
- Prohibit users from scripting their user IDs and passwords on desktops used for intranet access.
- Prohibit scripting of user IDs and passwords on laptops to be used for remote access.
- Prohibit Internet access for anything other than business purposes.
- Make boot-level passwords mandatory for all users.
- Classify all data as to importance and enforce relevant access restrictions.
- Lock up or otherwise secure all laptops, desktops and peripherals after business hours.
- Require users to use file-level passwords on files that contain sensitive information.

— IDG News Service

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Managing

By Alan S. Horowitz

If you hope to rise to a leadership position but are afraid your introverted personality will thwart your ambitions, take heart. The good news, experts say, is that introverts can be effective leaders, too. Chances are you have strengths that can be the foundation of a strong leadership style.

And there are many ways to improve on any weaknesses that hold you back. The experts' message: Don't give up.

The fact is, introverts have a lot going for them.

"The introvert is the most effective leader. He's quieter, more observant, more of a listener, longer in thought. To me, these are assets to leadership," says L. Paul Ouellette, CEO of Ouellette & Associates Consulting, Inc., an information systems human resources consultancy in Bedford, N.H.

Darwin A. John, the soft-spoken managing director of information and communications systems at the Church of Jesus Christ of Latter-day Saints in Salt Lake City, breaks down leadership into two qualities: the ability to create and set a vision, and the ability to communicate that vision and mobilize people to carry it out. According to John, creating the vision is best done by introverts, who are thoughtful and able to visualize the future.

The second quality, which emphasizes communication, mobilization and building a sense of excitement, is where the extrovert has the edge, he says. The challenge that IS professionals often face, John adds, is "being able to see it but not being able to get it implemented."

Bart Bolton, a consultant in Upton, Mass., who facilitates leadership training forums for the Society of Information Management, says he likes the introvert's technical know-how. "A leader must have followers," he says. "If somebody has a high level of expertise, others will follow that person because of that expertise, not because [that person] can get up on a podium and give a speech."

Introverts tend to think things through and consider situations carefully, which is a strength. Extroverts, says Shandon Gubler, director of electronic products at the Covey Leadership Center in Provo, Utah, are so confident of their ability to persuade people that they often don't properly prepare and fully consider their ideas. "I would take a person who is well-prepared, that has introverted tendencies, over one who is falling back on their personality ethic," he says.

Introverts "are smart, and they come with that powerful analytical capacity," says Dick Dooley, a consultant in Riverwoods, Ill., and a former chief information officer at major banks.

Thoughtful, good at listening, careful, analytical, technically knowledgeable, smart, well-prepared — these traits of introverts can be valuable leadership assets to build upon.

What to do

You don't have to become an extrovert to be an effective leader, but you will need some of the extrovert's skills. And although they may not come naturally, there is no shortage of ways to develop and improve those skills, even if you can't get away to take a leadership training program.

Leadership requires interacting with people, which doesn't come naturally to introverts. Harvey Shrednick, a self-described introvert and ex-CIO who is director of research at the Center for Information Technology at Arizona State University in Tempe, recommends that introverts master needed leadership skills by doing them over and over again, much as they might do morning exercises.

"You've got to get out of your office and pepper your schedule with stuff where you're engaging people and proactively seeking out people," he says. The Myers-Briggs personality test (see story, page 75) pegged Shrednick as having a significant tendency toward introversion. "In order to combat that, I had to consciously push myself to break out of my inner self," he says.

If you tend to be an observer rather than a leader, force yourself to take the initiative. "We [in IS] have typically had the kind of people who go away and write code by themselves. The introvert [has] discomfort in being the initiator and being proactive," says Jeff Clancy, a self-described introvert who until recently was vice president of information services at Citizens Gas & Coke in

Leader within, *page 78*

Most IS professionals are introverts. Does that mean they can never be leaders? Not if they develop . . .

The leader

Retention attention

What's foremost on the minds of chief information officers these days? Calculating the value of information technology investments and aligning IT with the business, says Jim Kinney, president of the Society for Information Management (SIM).

But the issue CIOs are talking about wherever Kinney goes is the recruiting and retaining of quality people.

"Turnover rates have increased for everyone I talk to," Kinney says. The combination of a hot job market, fear of downsizing and the erosion of corporate loyalty has CIOs going the extra mile to find good employees. At Kraft Foods in Northfield, Ill., where he's the CIO, Kinney is not only doubling the number of college interns, but also offering signing bonuses to December graduates who will commit to Kraft several months before they graduate.

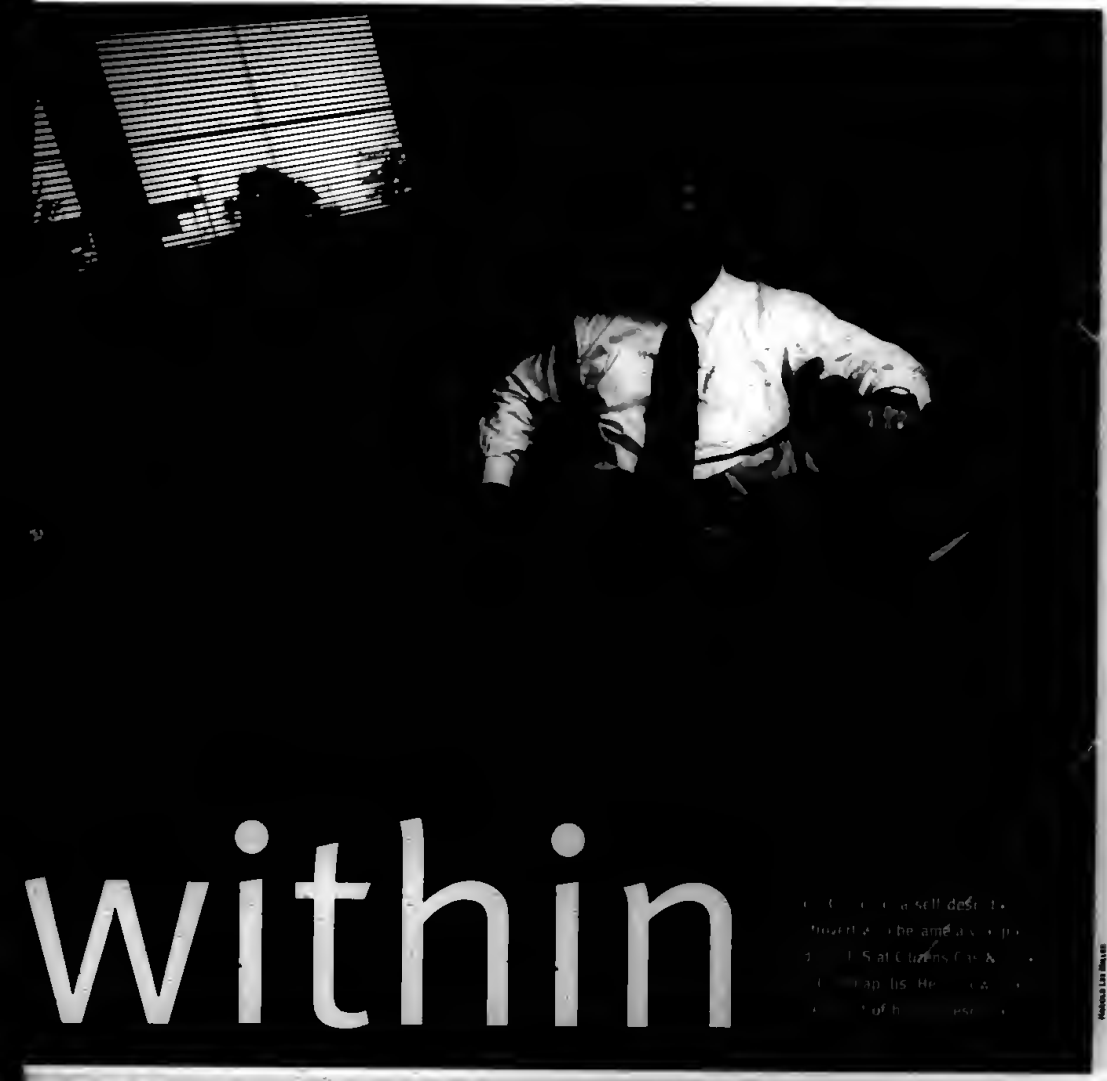
Kinney says SIM helps member companies retain top staff through education and training programs such as its Learning Forum. Programs that expose his staff to "outside perspectives . . . provide them with a better feeling about Kraft. They say, 'Here is a progressive company that is not inwardly looking,'" he says.

In the executive suites, the question CIOs are being asked is, "How do I put an economic model around IT investments?" IT isn't regarded as a mystery anymore, Kinney says. "There's a recognition finally by the [chief financial officers] and CEOs of companies that this IT business is no different from any other. There ought to be a clear [return on investment], there ought to be ownership for making this happen and there ought to be some advantage and productivity gains to our cost structure."

Kinney says the top tactical decisions CIOs are making involve the year 2000 issue and selecting the "server operating system, the desktop operating system and the Internet browser."

— Allan E. Alter

FROM BACK SEAT TO DRIVER'S SEAT
Technology defines a business today because it can help define new opportunities, columnist Jim Champy writes. Page 78



within

Photos: Lee Bauer

What is an introvert?

The Myers-Briggs Type Indicator, a widely recognized evaluation tool, indicates that introverts share these traits:

- Are oriented toward their inner world
- Focus on ideas
- Are reflective
- Consider things deeply before acting

This compares with extroverts, who tend to share these traits:

- Are oriented toward the outer world
- Focus on people and things
- Are active
- Use trial and error with confidence

"The behavioral characteristics [of the introvert] tend to be along the lines of preferring to work in solitary, liking to get into things in depth, [doing] their best thinking alone and [wanting] to organize their thoughts before speaking." – **Gerald P. Macdaid,** CEO of the Center for Applications of Psychological Type, Inc. in Gainesville, Fla.

From the mouths of users

Customers (or users, in the information systems vernacular) say the strangest things — and launch a lot of laughs saying them.

In their new paperback, *Coaching Knock Your Socks Off Service* (Amacom), Ron Zemke and Kristin Anderson offer customer-service supervisors and peers advice in honing their skills. They also offer comic relief, detailing some of the things customers say, especially when it comes to computers.

▶ *From Rich Stimek*
Grumman Data Systems, Long Island, N.Y.:

CUSTOMER SERVICE REP: You'll have to make up a new password.
CUSTOMER: Okay. *(Long pause.)*
REP: Sir? What's happening?
CUSTOMER: I made upa new password and nothing happened. Oh! Was I supposed to key it in?

▶ *From Doyle Smidt*
Dialog Information Systems
Palo Alto, Calif.:

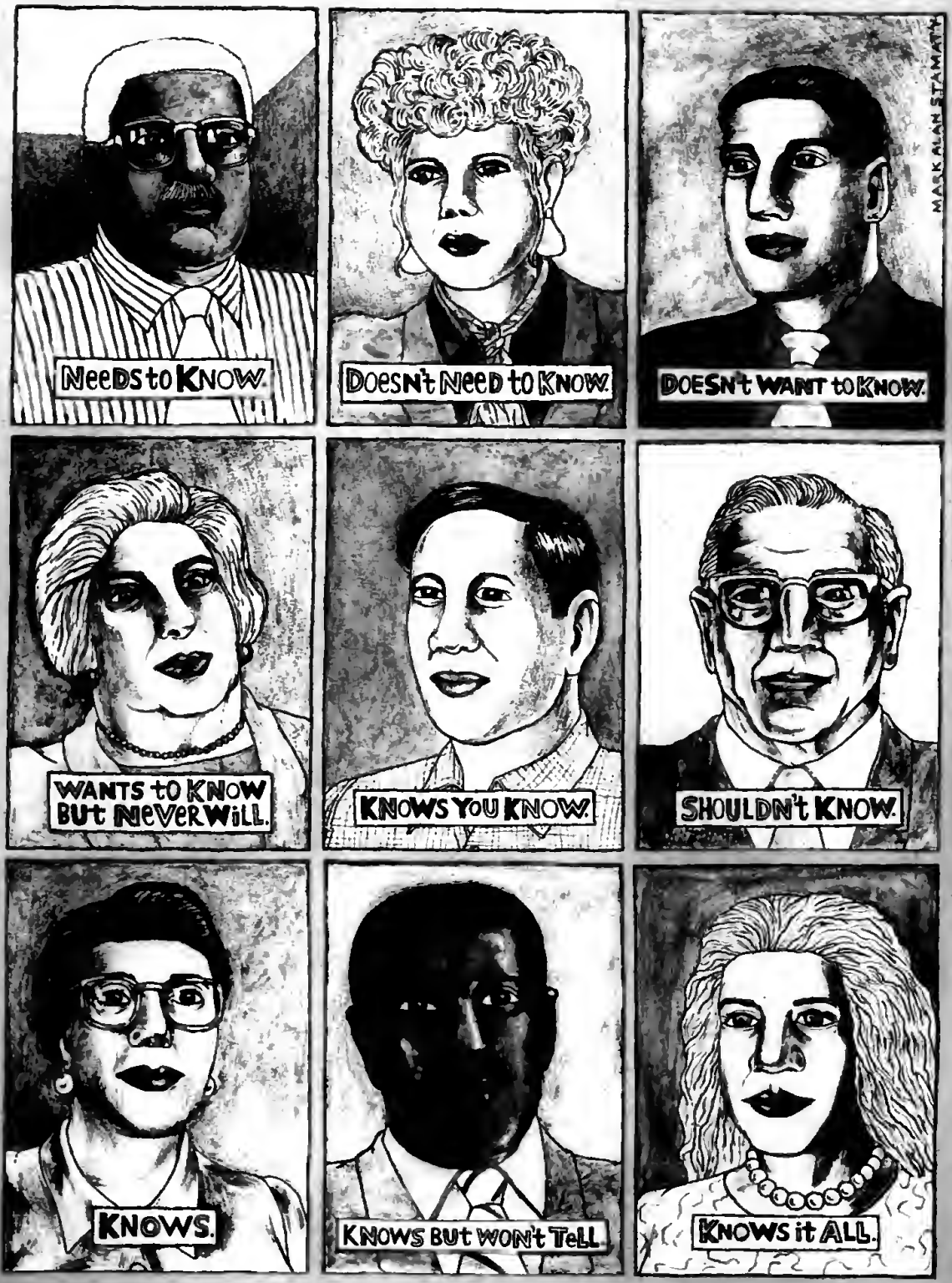
CUSTOMER: What database do I search to get information on the calcification of wombats' toes?

▶ *From* The Wall Street Journal *(March 1, 1994):*

CUSTOMER: I've pushed and pushed on the foot pedal, and I can't get this computer started.
CUSTOMER SERVICE REP: Foot pedal?
CUSTOMER: Yeah, this white thing with the little ball on the bottom and the clicker at the top.

To our readers

We will no longer print a monthly listing of workshops for IS managers. But you can find the listing at our World Wide Web site, @Computerworld (www.computerworld.com).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Now batting cleanup: Information technology

In our era, technology defines what the business is because of its power to define new opportunities

Does it really matter how business leaders view information technology as long as they believe it's important? You bet. Especially to IT executives. Believing it's important hardly matters. What's required is rigorous thinking as to *how* it's important to the fate of the enterprise.

The Wall Street Journal recently ran a front-page story about the technology concerns of Hugh McColl, chairman and CEO of NationsBank Corp. and one of banking's true visionaries. The story described his anxiety: He knows technology will dramatically change the banking industry; he just isn't sure how.

"The thing is like a tidal wave," McColl says. "If you fail in the game, you're going to be dead." Without knowing exactly what's over the horizon, McColl knows he must invest aggressively to invent and influence the future direction of banking. He understands the dire consequences of guessing wrong.

The odds favor this former Marine because he has always stayed close to the front lines of the battlefield. But he is outnumbered, unfortunately, by a lot of blissfully ignorant CEOs for whom IT is only a cost to be contained, an aid to service instead of a transformer. This all-too-frequent situation helps explain why the best information systems executives I know — as a crucial part of their mandate — truly educate senior leaders

Robert Capa, one of the greatest combat photographers of the century, once told one of his students: "If your pictures aren't good enough, you're not close enough." His acute insight carries over directly to my point: If the technology of a business isn't good enough, then it isn't close enough to defining what the business should be. It's playing a walk-on role instead of a leading role. And you and I know that if a CEO only superficially understands technology, technology's impact on the firm's overall competitive well-being will be correspondingly slight. Have you asked the post office to trace a lost package lately?

A business school professor argued with me recently that technology was only an enabler, that economic, political and social forces determine the strategy of a business and the shape of industries. Because this is America, business professors have the right to be not only wrong but also dead wrong. In our era, technology defines what the business is because of its power to define new opportunities. Look at Fred Smith and Federal Express Corp. Technology defined the industry he imagined. And where would retail banking be without automated teller machines? Also, airline reservations systems have created a stand-alone industry.

To use a baseball analogy, why has IT gone from being a good utility player to being a power hitter?

The answer lies principally in the advent of pervasive communications technologies; the Internet is the most dominant example. Those kinds of communications technologies can change the relationship between a business and its customers — finally delivering on technology's strategic promise. Almost every industry feels its effects: media, health care, banking and retailing. And businesses, such as digital book and music stores, food shopping services from home and virtual banks, are being created based on the technology. Often, those businesses involve a combination of producers whose businesses are converging around a new set of customer needs.

But how should business executives think about IT as they begin to invent the future?

Here are a few questions you might ask to help get them started:

- What is the product or service your customers really want (or will really want)? Can you create a business to provide those products or services using today's technologies?
- How will your industry be restructured because of IT — new combinations of producers, new products, new services?
- Will IT allow new competitors to enter your markets? What should you do about it?
- What capability does your company have to deal with those issues? Remember, dealing with IT as part of a business strategy is much different from dealing with it as a business function.
- How much time do you have to act? Recognize that your managerial "time clocks" were set in the industrial age, when business change took years, if not decades. Change then was deliberate; today it's sudden. The life span of the status quo is constantly shrinking.

IT has become a strategic necessity. Believe it, act on it or become a footnote in history.

Champy is chairman of consulting at Perot Systems Corp. in Cambridge, Mass. His newspaper columns are syndicated by Tribune Media Services.

Leader within

CONTINUED FROM PAGE 74

Indianapolis. He is now vice president of human resources.

Ouellette recommends another way to push yourself: When you leave town, turn over management responsibilities to your trusted assistant and tell him not to call you. Introverted leaders sometimes overmanage; this is a way to break that habit.

There are other habits to break. "You must be thinking not so much about the sophistication of your code as about yourself as a business manager," says Bob King, vice president of information services at United Healthcare Corp. in Hartford, Conn. "Talk about things like, 'When this program runs it has this kind of benefits.' Connect your effort to the business priorities or business benefits that your company has. That's not a habit most IS people follow."

Because introverts often have a hard time acknowledging their subordinates' efforts, Sherman Roberts, a program manager at the Cambridge Center for Behavioral Studies in Cambridge, Mass., recommends carrying 3- by 5-inch cards on which to record the names of people you compliment and whose performance improvement you reinforce and to note the frequency of such feedback.

Also, people who are uncomfortable with communications can sometimes generate inappropriate aggression. "The classic systems programmer is going to tell you how dumb you are first before he tells you the solution to the problem because he has to demonstrate how smart he is," Dooley says.

Gubler recommends that introverts not hide their discomfort with public speaking, personal interaction and the like. "I would advise them to go public with their weakness right off the bat," he says. "If a person goes public, they've set themselves up to be helped."

Perhaps the most important thing the introverted IS leader can do is acknowledge his shortcomings and make a commitment to improve those skills. As Normand L. Frigon Sr., co-author of *The Leader* (Amacom, 1996, $17.95), says, "If you are an introverted person, very computer-centric, the first thing you have to decide is, 'Yes, I want to be a leader. Therefore, there are certain things I know I must work on.'"

Acknowledging that — while building on your strengths as an introvert — makes the journey toward becoming a successful leader much shorter and faster. ■

Horowitz is a freelance writer in Salt Lake City.

Two out of three

Myers-Briggs Type Indicator research indicates that 67% of computer professionals are introverts *(CW, May 1, 1995)*.

Of them, about a third fall into the category the Center for Applications of Psychological Type describes as "analytical, manager of facts and details, dependable, conservative, systematic, painstaking, decisive, stable," people who "are at their best when charged with organizing and maintaining data and material." Sound familiar?

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Surf Sites

Practical Internet sites for IS managers

By Leslie Goff

FEATURED SITE:

National Performance Review Home Page
www.npr.gov

Corporate information systems managers can think of this repository of research, tools and management guidelines as their personal business process re-engineering consultant.

Vice President Al Gore established The National Performance Review to provide a central source of information for the Clinton administration's "reinventing government" initiative.

The site is aimed at federal employees and contains some sections on workplace procedures that aren't universally applicable, as well as some bureaucratic language and blatant cheerleading. But two sections — "Initiatives" and "'How-To' Tools" — offer content that relates directly to the challenges that any business in the 1990s faces. If you're involved in reinventing IS or the corporation, you'll find plenty to guide you through any rough spots. "'How-To' Tools" has three sections. Click immediately on "Interagency Benchmarking and Best Practices Council" to access several step-by-step guides to benchmarking. Highlights include the following:

- The Best Practices/Innovative Practices Database contains a useful paper that explains how management can use computer networks to exchange and speed the adaptation of best practices among business units and departments.
- "Initiatives" addresses issues such as management leadership, employee empowerment and intradepartmental cooperation in business process re-engineering. This area promises an upcoming page dedicated to information technology initiatives.

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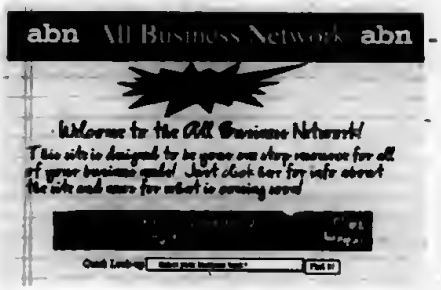

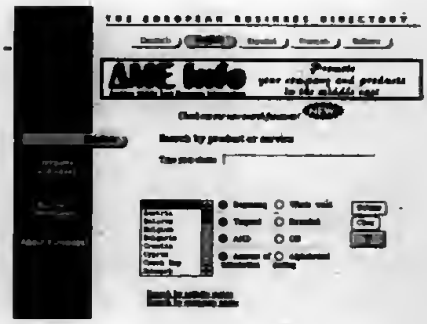

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Enterprise Reengineering Magazine
www.reengineering.com

This no-frills online version of monthly magazine *Enterprise Reengineering* offers a sneak peek at some articles in the current issue and posts past issues. If you are planning a reengineering project, need facts or anecdotes for a presentation or are grappling with the results of a reengineering project, you'll find it relevant reading. But you may have to invest some time in the effort.

Although the articles are worthwhile, keyword searching would provide added value. As it is, you have to point-and-click your way through each issue to find articles that apply to your situation. Articles from past issues include an examination of the year 2000 problem (June) and tips on how to survive major changes in IS organizations (August).

Training and Seminar Locator
www.tasl.com/tasl

Training and Seminar Locator, which bills itself as an education, training and development resource center for business and industry, delivers for surfers who seek training in any subject and medium. The all-text site loads quickly, and the search engine performs efficiently. It lets users search by subject for scheduled events, services available on demand, specific products or vendors.

Under services available on demand, a search for "information systems" yielded only three courses. But searches for specific products and scheduled events, using more generic subjects, returned broader selections. For example, "leadership" under scheduled events had 16 matches. And "teams" under specific products returned a few pages of videotape and multimedia titles.

All Business Network
www.all-biz.com

This directory is a portal to a wide and diverse range of business resources on the Internet. Though not efficiently organized, the site is almost comprehensive. It covers nearly every area of business and provides job searches, business travel information and business services.

The links from the home page's Headline News, Reference Desk and Off the Shelf overlap a bit, but each has a different perspective.

The Job Bank page links to interviewing tips and other advice articles, recruiters, online resume posting services, training sites and virtual job fairs.

The subject-oriented listings are of variable quality, but the Women@Work section is one of the best.

Goff is a freelance writer in New York.

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Hyperion software

Buyer's Guide

It's time for "Name That Server"

A review reveals that the Web server market is indeed maturing, and it's getting harder to tell the differences among the products from the client end. In the areas of ease of setup and design, it's small developer O'Reilly & Associates first, Microsoft second and Netscape third.

By Ted Vegvari

FIRST IN AN OCCASIONAL SERIES OF REVIEWS OF WEB SERVERS. HERE WE LOOK AT:

O'Reilly's Website Professional 1.0, Microsoft's Internet Information Server 2.0 and Netscape's Enterprise Server 2.0

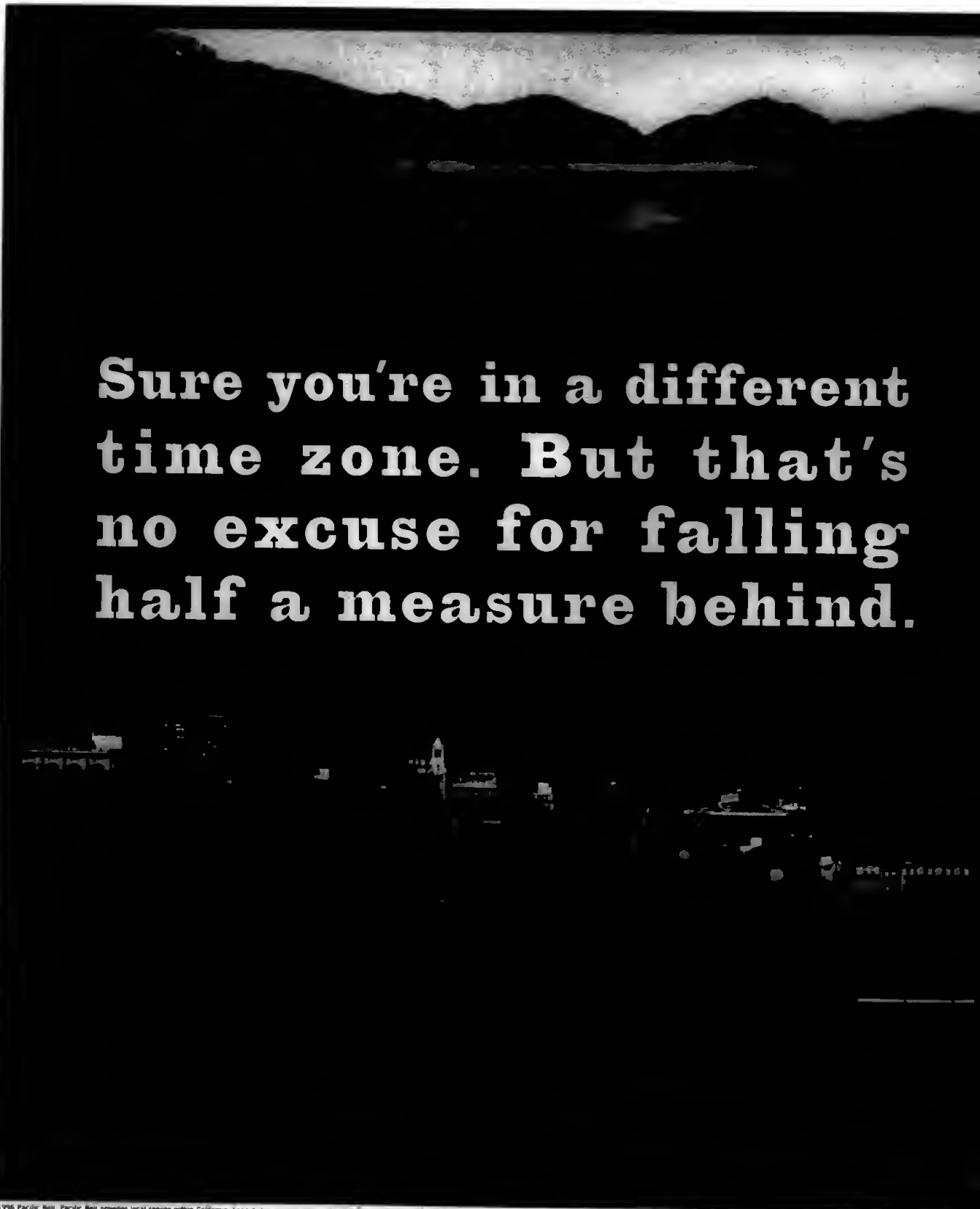
It was an excellent deal. The prize was $100 to anyone in our offices who could name which of the three Web server software products included in this review was running at the other end of the cable — either by a dial-up line or over our intranet. The losers had to give me $5.

Three World Wide Web servers were set up side by side, and not one of more than 30 experienced users, mostly consultants and technicians, could tell the differences at the client end among the three products we tested. I ended up with a delicious meal.

That remarkably simple, yet revealing, test validates what many information systems departments now realize: The Web server software market has matured to a point where buyers can be confident that they will get the same performance and core functions from multiple vendors. So if there are bottlenecks for users accessing your Web site, they're more likely to be on the network, rather than being the fault of the Web server software.

Users typically don't know to which Web server product they are connecting. Recognizing that fact does help an IS manager reduce the

"Name That Server," *page 89*



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23 Dir./Mgr. Sys. Development, Systems Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Management
60 Sys. Integrators/VARs/Consulting Mgr.
CORPORATE MANAGEMENT
11 President, Owner/Partner General Mgr
12 Vice President, Asst. VP
13 Treasurer/Controller Financial Officer
DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
70 Medical Legal Accounting Mgr
OTHER PROFESSIONAL MANAGEMENT
80 Information Centers/Libraries, Educators, Journalists, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend purchase (Circle all that apply)
Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) Nas/Telap
App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No

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C. 5,000 – 9,999	☐	☐
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E. 500 – 999	☐	☐
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85 Communications Systems/Public Utilities/Transportation
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DEPARTMENTAL MANAGEMENT
51 Sales & Mktg. Management
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OTHER PROFESSIONAL MANAGEMENT
80 Information Centers/Libraries, Educators, Journalists, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend purchase (Circle all that apply)
Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) Nas/Telap
App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No

4. How many people are employed at this location and in your entire organization including all of its branches, divisions and subsidiaries? (Select only one per column.)

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B. 10,000 – 19,999	☐	☐
C. 5,000 – 9,999	☐	☐
D. 1,000 – 4,999	☐	☐
E. 500 – 999	☐	☐
F. 100 – 499	☐	☐
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"Name That Server"

CONTINUED FROM PAGE 85

variables when selecting Web server software. It allows the decision to be based primarily on ease of use, development and management tools, reliability and scalability.

Attractive product pricing by vendors has also significantly leveled the playing field.

The primary issues — ease of use and reliability — require hands-on evaluation.

However, the recent crop's comparative ease in setting up Web server software has shifted the responsibility of further simplification back onto the shoulders of the operating system. What is most confusing to many users is the host of technical terms that can stop the installation cold and require lengthy help from the manufacturer's technical support staff. It's up to the manufacturer of the operating system and the Web server to simplify the process.

We tested three well-known Web server products designed to run in Windows and Intel Corp. hardware environments: O'Reilly & Associates, Inc.'s Website Professional 1.0, Microsoft's Internet Information Server (IIS) 2.0 and Netscape Communications Corp.'s Enterprise Server 2.0. What we learned surprised us.

The giants, Microsoft and Netscape, were bested by a small developer in some key areas. O'Reilly's Website Professional wins for ease of setup and great design; Microsoft wins for administration, integration and management; Netscape wins for being the "standards model."

On single-processor Compaq Computer Corp. servers (see box at left), these products performed equally well. But in additional tests using dual-processor machines, IIS proved to be more scalable and showed greater performance gains when taking advantage of the second processor; Website Professional and Enterprise Server virtually tied for second.

Vegvari is a principal at PC Lab, an independent testing and review facility in Palos Verdes, Calif.

Website Professional 1.0

O'Reilly & Associates, Inc.
Sebastopol, Calif.
(707) 829-0515
www.software.ora.com

O'reilly & Associates is one of the first vendors on the market with Web server software. Its Website Professional addresses the key requirements that are most commonly sought by Web administrations, whether they are just beginning or advanced: ease of use, clear documentation and reliability. We ran Website Professional on a production server for a month without failures or problems.

The first thing we noticed after opening the product box was that there was oo shortage of well-written documeotation. Online documentation is also available, but the manuals initially provide the start-up information. Although it's unlikely that the "Getting Started" guide will be needed, it clearly supports the installation procedure.

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"Name That Server"

CONTINUED FROM PAGE 85

variables when selecting Web server software. It allows the decision to be based primarily on ease of use, development and management tools, reliability and scalability.

Attractive product pricing by vendors has also significantly leveled the playing field.

The primary issues — ease of use and reliability — require hands-on evaluation.

However, the recent crop's comparative ease in setting up Web server software has shifted the responsibility of further simplification back onto the shoulders of the operating system. What is most confusing to many users is the host of technical terms that can stop the installation cold and require lengthy help from the manufacturer's technical support staff. It's up to the manufacturer of the operating system and the Web server to simplify the process.

We tested three well-known Web server products designed to run in Windows and Intel Corp. hardware environments: O'Reilly & Associates, Inc.'s Website Professional 1.0, Microsoft's Internet Information Server (IIS) 2.0 and Netscape Communications Corp.'s Enterprise Server 2.0. What we learned surprised us.

The giants, Microsoft and Netscape, were bested by a small developer in some key areas. O'Reilly's Website Professional wins for ease of setup and great design; Microsoft wins for administration, integration and management; Netscape wins for being the "standards model."

On single-processor Compaq Computer Corp. servers (see box at left), these products performed equally well. But in additional tests using dual-processor machines, IIS proved to be more scalable and showed greater performance gains when taking advantage of the second processor; Website Professional and Enterprise Server virtually tied for second.

Vegvari is a principal at PC Lab, an independent testing and review facility in Palos Verdes, Calif.

Test Bed

Web server operating system: NT Advanced Server 4.0

Web server hardware (primary): Compaq ProSignia XL 500 server, 48M bytes of RAM, 2G-byte SCSI-2 hard disk.

Internet connectivity: U.S. Robotics Corp. Allegra ISDN Network and software connected to 128K bit/sec. Integrated Services Digital Network (ISDN) dial-up line through Earthlink Network.

Network server operating system: NT Advanced Server 4.0

Network server hardware: Compaq ProSignia XL 500, 64M bytes of RAM, 2G-byte SCSI-2 hard disk, Cogent Information Systems, Inc. EM110 EMaster Fast Ethernet Peripheral Component Interconnect (PCI) adapters.

Workstations: Ten Compaq Deskpro XL 5100 PCs with 32M bytes of RAM, 1.2G bytes of disk storage, Windows NT Workstation 4.0, Cogent EM110 EMaster Fast Ethernet PCI adapters and U.S. Robotics 28.8V Everything analog modems attached to analog telephone lines.

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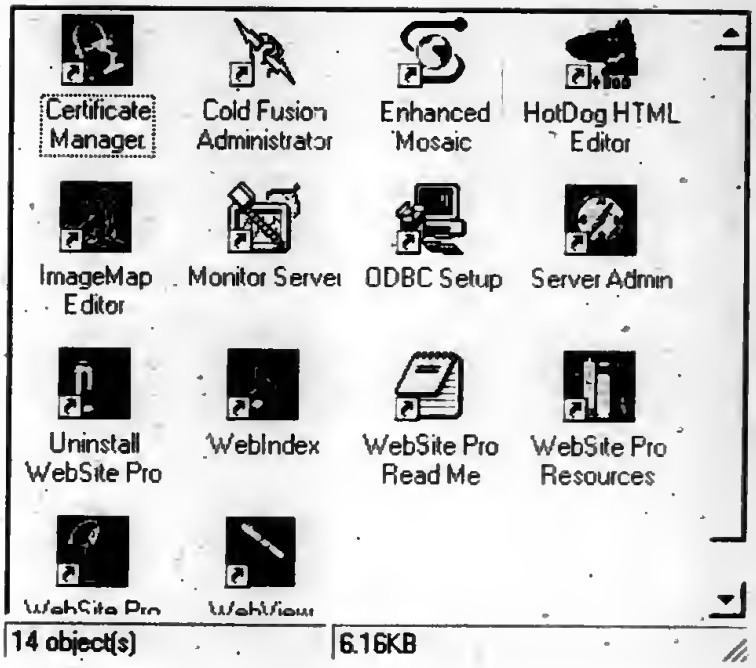

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Website Professional

CONTINUED FROM PAGE 89

After establishing a connection to the Internet using Windows NT's dial-up connection, we assigned an IP address and Web site name using the server administrator utility and tested the connection from a remote dial-up account. The process was almost identical to establishing a dial-up connection to an Internet service provider using Point-to-Point Protocol. Website Professional simply required an IP address and domain name to establish the connection.

To use cryptographic security, users must obtain a public-key certificate. Website Professional comes with a certificate request manager that leads you through the process of creating a certificate request and generating the key pair, making it easy to obtain and manage certificates.

Various utility programs are bundled with Website Professional, including WebView, for graphical views of your Web site when designing or troubleshooting; WebIndex and WebFind, for full-text search and retrieval; Cold Fusion, a development tool for linking Web servers to back-end databases; Sausage Software's HotDog Hypertext Markup Language (HTML) editor; Map This, for designing clickable image maps; Spyglass, Inc.'s Mosaic Web browser; and Website Professional resources, which alone make the product worth buying because they provide excellent reference materials and tutorials from beginning to advanced levels.

We created test Web pages that contained 45M bytes of images and text. We then used Netscape's Navigator 3.0 to repeatedly load the Web pages from 10 PCs connected over an intranet. We repeated the process using Microsoft's Explorer.

The average time to load was 14 minutes using both Netscape and Internet Explorer. We found that Website Professional's performance matched that of IIS and Enterprise Server.

The same comparative results were obtained during tests using 10 28.8K bit/sec. dial-up connections.

PROS: Website Professional is the easiest product of the three to set up and configure, and it has a rich choice of available vertical applications. It has excellent features. The most valuable, in our opinion, include cryptographic security, Secure Sockets Layer (SSL) and Secure Hypertext Transport Protocol with multi-identity (multiple certificate); application programming interface-integrated support for the Perl Version 5 language and Common Gateway Interface-mode Perl; and a server-side Java software development kit, including a server-Java interface, Java 1.0.1 runtime.

CONS: Remote management is limited in that Website Professional must be installed on both the remote and local computer.

RECOMMENDATIONS: We would like to see an HTML interface for remote administration instead of requiring that the application be loaded on both the local and remote machine.

This is easily the best product for most Web installations. It's easy to install and performs well. It is excellent for publishing, online catalogs and secure credit-card transactions. It also keeps up with the products from the big boys.

Internet Information Server 2.0

Microsoft Corp.
Redmond, Wash.
(800) 426-9400
www.microsoft.com

Installation is fast and easy to complete if your Windows NT operating system is configured properly. But it can be a problem, for example, if the domain name hasn't been set in the control panel/network/applet. Then the IIS will advise you of a problem, but it won't lead you through the process of making the necessary correction.

It's already confusing figuring out where to plug in IP addresses, domain name server names and other specifications. That entire process should be reduced to just a few simple entries, as is found in O'Reilly's Website Professional.

Troubleshooting after installing IIS can be very difficult. It's easier to uninstall and reinstall.

After completing the installation and successfully testing the connection, we found IIS to be elegant and remarkably integrated with NT. Documentation is thorough, but you have to wade through too much information to find what you are looking for. It really needs more wizards.

We found NT's ability to easily set NT directory- and file-level access rights and allow specific users to update files especially useful and foresee many possibilities when considering Internet groupware and remote updates. That was much easier to set up using IIS than Enterprise Server or Website Professional.

For large NT shops with remote locations and administration requirements, that level of integration is invaluable, and it is foolish not to factor that in to the selection process. We highly recommend IIS over Enterprise Server in distributed corporate environments because of that, and we predict that when directory services for NT mature, its wide-area network administration facilities will begin to approach those of Banyan Systems, Inc.'s Vines.

IIS supports SSL security, and we were able to easily generate a key pair, which is necessary to acquire an SSL certificate, through the new Key Manager application that is installed with the product and located in the Internet Server program group. However, that procedure requires that a lot of information be ready beforehand.

IIS lets users generate a key pair on another server as well as install certificates on remote servers. We successfully tested that rather complicated feature. Web and NT services and security are so seamlessly integrated that it's impossible to tell where IIS leaves off and NT begins. File transfer protocol and Gopher are also integrated in IIS but not in Website Professional.

PROS: Performance was excellent. Features, integration and management make this our choice for shops that require centralized administration and standardization.

CONS: Beyond the basic installation procedure, additional configuration is complicated and documentation is unclear.

RECOMMENDATIONS: IIS needs more wizards and a simpler installation process, with the ability to lead the user through error corrections in the NT setup and configuration.

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Computerworld Editorial Calendar

January - June, 1997

Issue Dates	Ad Closings Color*	B&W	Editorial Features	Show Distribution & Ad Readership Study Issues
Jan. 2	Dec. 6	Dec. 13	**Annual Forecast Issue** **Annual IS Jobs Forecast**	
Jan. 6	Dec. 20	Dec. 27	**Closer Look:** Melding the browser into the desktop	
Jan. 13	Dec. 27	Jan. 3	**Buyer's Guide:** Web commerce servers	
Jan. 20	Jan. 3	Jan. 10	**Closer Look:** HTML development tools **Managing:** Project management •**IS Leadership Series**	
Jan. 27	Jan. 10	Jan. 17	**Buyer's Guide:** Network management suites •**Intranet Monthly**	
Feb. 3	Jan. 17	Jan. 24	**Customer Satisfaction Quarterly:** Managers rate their networking vendors •**Computerworld Financial Services Journal,** •**Computerworld Retail Journal**	**ComNet:** Washington, D.C. 2/3 - 2/6 — Starch Study
Feb. 10	Jan. 24	Jan. 31	**Special Feature (Managing, In Depth, Guide):** Computer Security **Closer Look:** Risk management systems in the financial sector	
Feb. 17	Jan. 31	Feb. 7	**Buyer's Guide:** Unix RAID devices •**IS Leadership Series** •**Computerworld Healthcare Journal,** •**Computerworld Telecom Journal**	
Feb. 24	Feb. 7	Feb 14	**Buyer's Guide:** PC-based videoconferencing systems •**Annual Premier 100 magazine** •**Intranet Monthly**	
March 3	Feb. 14	Feb. 21	**Closer Look:** Web usage tracking tools •**100 Hot Emerging Companies magazine**	
March 10	Feb. 21	Feb. 28	**Buyer's Guide:** Massively parallel servers •**Global Innovators quarterly supplement**	
March 17	Feb. 28	March 7	**Closer Look:** Web-oriented peripherals •**IS Leadership Series**	
March 24	March 7	March 14	**Buyer's Guide:** Enterprise application development tools •**Intranet Monthly**	
March 31	March 14	March 21	**Careers:** IS staff training survey – the companies that do it best **Closer Look:** The scalability of data warehouse products	

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Issue Dates	Ad Closings Color*	B&W	Editorial Features	Show Distribution & Ad Readership Study Issues	
April 7	March 21	March 28	**Buyer's Guide:** Components and browser plug-ins •Computerworld Financial Services Journal, •Computerworld Retail Journal •Campus II magazine (actual issue date TBA)		
April 14	March 28	April 4	**Meneging:** Technology for customer intimacy **Closer Look:** Intel workstations vs. UNIX		
April 21	April 4	April 11	**Customer Satisfaction Querterly:** Managers rate their software vendors •IS Leadership Series •Computerworld Healthcare Journal, •Computerworld Telecom Journal		
April 28	April 11	April 18	**Closer Look:** Sonet update •Intranet Monthly		
May 5	April 18	April 25	**Buyer's Guide:** Remote Access Servers **Meneging:** Year 2000	**Networld + Interop:** Las Vegas, 5/5 - 5/9	Starch Study
May 12	April 25	May 2	**Speciel Feeture (Maneging, In Depth, Guide):** Object technology in the corporation		
May 19	May 2	May 9	**Buyer's Guide:** Enterprise DBMS •IS Leadership Series		
May 26	May 9	May 16	**Cereers:** Annual Job Satisfaction Survey **Closer Look:** Beyond Visual GLS •Intranet Monthly		
June 2	May 16	May 23	**Buyer's Guide:** Web development packages •Best Places to Work magazine •Computerworld Financial Services Journal, •Computerworld Retail Journal	**Comdex Spring/ Windows World:** Atlanta, 6/2 - 6/5	
June 9	May 23	May 30	**Meneging:** Reskilling the IS organization **Closer Look:** RMON – Product comparison and who's using it •Global Innovators quarterly supplement		
June 16	May 30	June 6	**Buyer's Guide:** Pentium Pro Servers •IS Leadership Series •Computerworld Healthcare Journal, •Computerworld Telecom Journal	**PC Expo:** New York 6/17 - 6/19	Starch Study
June 23	June 6	June 13	**Closer Look:** Internet Email Software •Intranet Monthly		
June 30	June 13	June 20	**Buyer's Guide:** PDAs		

Editorial Contacts (508) 879-0700: *Annual Forecast Issue* – Steve Ulfelder; *Closer Look* – Kevin Fogarty; *Buyers Guide* – James Connolly; *Managing, Leadership Series* – Allan Alter; *Electronic Commerce Journal, Premier 100, Industry Journals* – Alan Alper; *Campus Edition, Best Places to Work* – Joyce Chutchian; *Intranet Series* – Ann McCrory

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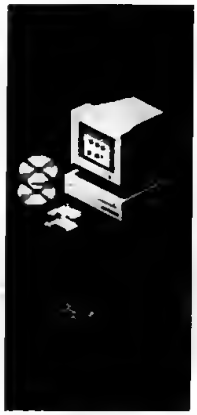
Buyer's Guide



Welcome to the Netscape Enterprise Server 2.0 Setup program. This program will install Netscape Enterprise Server 2.0 on your computer.

It is strongly recommended that you exit all Windows programs before running this Setup program.

Click Cancel to quit Setup and then close any programs you have running. Click Next to continue with the Setup program.

WARNING: This program is protected by copyright law and international treaties.

Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.

Next > Cancel

Netscape Communications Corp.
Mountain View, Calif.
(415) 937-2555
www.netscape.com

nterprise Server installation is initiated by running entrprse.exe. During installation, a setup wizard leads you through the process and provides a choice of which directory to use prior to copying program files, which is similar to Netscape's Navigator.

Netscape has maintained a consistent look and feel for its suite of products. Navigating becomes intuitive after you become comfortable using a browser as the interface for configuration and management. But it does take some getting used to — it doesn't look like Windows. It is extremely helpful, however, especially considering how frequently updates and new versions of mission-critical products are released.

Internet software is Netscape's bread and butter, and it shows. Administration is performed primarily through configuration screens using Navigator. That provides continuity, which translates to a reduced learning curve. But we feel that Enterprise Server doesn't have the depth of integration with NT that IIS commanded nor the ease of use that Website Professional demonstrated.

Enterprise Server was the only one of the three programs that crashed several times while running the server administration software, which really surprised us.

During installation, Enterprise Server advised that selecting a domain name would preclude other computers on the intranet from locating this Web server unless Dynamic Host Configuration Protocol was used. Again, we felt that having the option to use wizards at times such as that would help most users tremendously.

Enterprise Server consists of two servers: the Web Server, the main server; and the Administration Server, which is used to start, stop and configure the main server. Prior to writing the configuration files, we were advised to make changes to our TCP/IP configuration for optimization, which IIS and Website Professional didn't recommend or require.

Again, a portion of the installation was confusing. The examples used to describe how to select a name for the server shows two conflicting naming options.

The trade-off in using a Web browser to perform all administrative and configuration functions is that remote management is excellent, but using Web pages instead of "programs" isn't as efficient. Programs can be designed with much more functionality than a Web page.

We especially liked Enterprise Server's ability to provide a staging server, on which we placed work in progress, later moving it to the production directory. That is an extremely valuable feature and reduces the potential for accidental changes to production data, which happens frequently in Web shops. IIS and Website Professional don't offer that capability.

The integrated full-text search capability will meet most users needs and integrates the Verity Topic full-text search engine. But the shiniest gem buried in this product is integrated version control. That allows all content managed by Enterprise Server 2.0 to be automatically subject to version control. Each time a document is updated, a new version is created, and all old versions are accessible instantly. That's useful for keeping track of which webmaster updated which Web pages and when.

Enterprise Server covers all the bases. High-volume Web publishing shops with 10 or more full-time Web content developers and administrators accustomed to minicomputers and Unix environments will find a complete solution that is thought-out and well-designed from top to bottom.

Admin program crashed several times on two different machines. This product was clearly designed to provide a cross-platform solution. Its roots are still wet from being transplanted from Unix, and it doesn't "feel" like an NT product. The learning curve is significantly higher than Website Professional and IIS.

Netscape needs to decide which market it really wants — Unix or NT — and then design the interface for users of those platforms or develop two styles for two markets. ■

Glossary

Common Gateway Interface
A standard for external gateway programs to interface with servers, such as Hypertext Transport Protocol servers.

Domain name system
An electronic-mail addressing system that converts an E-mail address into an Internet address for transmission.

Dynamic Host Configuration Protocol
A standard protocol that assigns Internet Protocol (IP) configurations to computers.

File transfer protocol
A set of TCP/IP commands used to log on to a network, list directories and copy files.

Firewall
A network node set up as a boundary to prevent traffic from crossing segments.

Hypertext Markup Language
A standard for defining links between documents in an Internet-based environment.

Internet service providers
Public providers of remote connections to the Internet.

Proxy
A software program that connects a user to a remote destination through an intermediary gateway.

Secure Sockets Layer
A protocol that supplies secure data communication through data encryption and decryption.

Subnet mask
A TCP/IP configuration parameter that extracts network and host configuration from an IP address.

Enterprise Server 2.0

Netscape Communications Corp.
Mountain View, Calif.
(415) 937-2555
www.netscape.com

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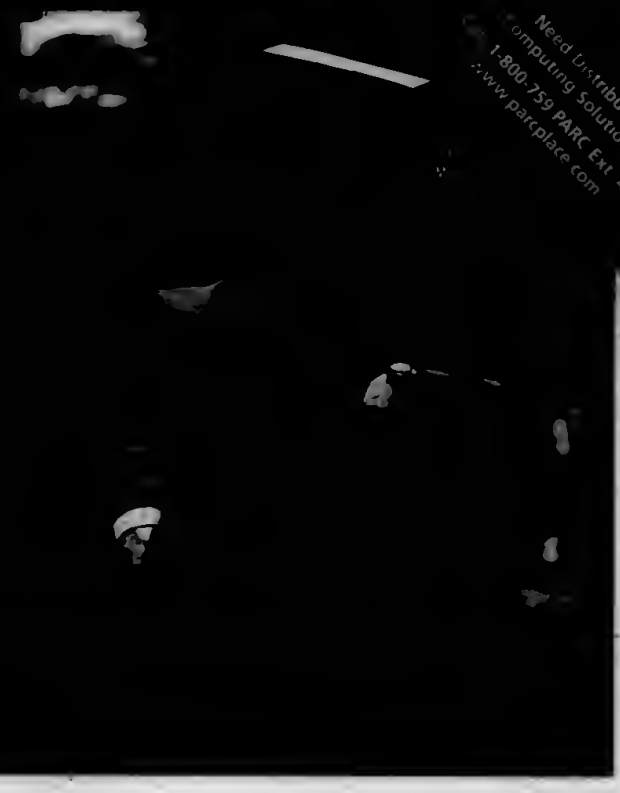

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ERGONAUT

ONE 'NAUT TESTS SOME OFFICE COMFORT PRODUCTS

By Joseph Maglitta

SKALPI
Who needs a pricey company masseuse? Here's Skalpi, a three-speed portable head massager. (Warning: Close your eyes or you'll need Dramamine.) Are we not Ergonauts? Wisco, (818) 980-6330.

WRIST GAUNTLET
Like any good armor, these Velcro gauntlets feel a bit . . . insect-like. A small price to pay for blunting the arrows of carpal tunnel syndrome, right Galahad? Smith & Nephew Roylan, Inc., (800) 558-8633.

WRIST REST
They look and feel like small intestines sheathed in felt, but this is more than just ordinary guts-in-a-bag. A decent wrist rest, the Gel-eez GL1 shines when folded in half as a mouse rest. Case Logic, (303) 530-3800.

SUSPENDERS
Power braces for the '90s. Striking, no-nonsense style and exceptional lumbar support. Whether you're hunting the halls for business synergies, uncrating the latest technology or firing off hot electronic mail from your ergo-chair, you'll appreciate this lightweight gut-tautener. [illegible] Ergonomics, Inc., [illegible] 621-5436.

GLARE SHIELD
At $49, it ain't cheap. But you'll spend that on Visine in six months if you don't have this most excellent glare shield. The best offense is a good defense, eh? Fellowes Computerware, (800) 945-4545.

Photography by Jack Foley

RING PEN

Virtual reality glasses
Your computer monitor should be wherever you look, right? Ask for the brand-new update of these three-dimensional specs. Is he working or watching TV? Not as sharp as a Sony Corp. Trinitron, but a heck of a lot more fun. Virtual IO, (800) 646-3759.

Gloves
Hand Speedos. More comfortable than you'd think. Thera-Glove eases existing pain, many testimonials say. Downside: You have to take them off to eat snacks. One colleague found them "kinky." Ooooh. American Orthopedic Appliance Group, (914) 534-9087.

Joystick
Let's all demand that more business software applications support easy-on-the-hands joysticks such as the F-16 Combatstick, shall we? "Let me blast those numbers once more for you, Mr. Dorkie." C H Products, (619) 598-2518.

Back pad
Like a soft, nagging mom who reminds you to sit up straight. My own natural surplus of padding made it a bit tight for me. Chase Ergonomics, Inc., (800) 621-5436.

Eight ball
Easy interface and sleek design make this the ultimate decision-support system. At mall novelty stores everywhere.

Chair
A chair's a chair, right? No way. This one's comfortable and not too pricey. Save your chief financial officer headaches. Girsberger Industries, (919) 934-0545.

Table
Cheap, sturdy, comfortable enough, rolls anywhere. The VW Bug of the Temporary Office Age. Anthro Co., (800) 325-3841.

Ring mouse
Point-and-click infrared Ring Mouse. Not much easier than the ordinary kind, but it makes you feel very powerful. Kantek, Inc., (800) 536-3212.

Foot pedals
Toe-tappers will dig a chance to put all that nervous energy to work. Wear out shoes, not hands. Bilbo Innovations, Inc., (408) 736-6086.

Armrests
Like Tang, these zero-gravity armrests seem inspired by tha space program. The floaty feeling kinda grows on you. Ergonomic Logic, Inc., (800) 527-6600.

Maglitta is a former *Computerworld* senior editor, corporate strategies.

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COMDEX Fall '96

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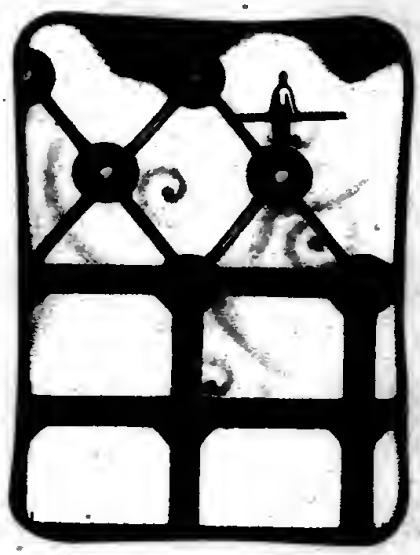
COMPUTERWORLD

intranets

THE MANAGER'S GUIDE TO WHAT'S REALLY IMPORTANT

INFRASTRUCTURE

FIRM FOUNDATIONS



ILLUSTRATIONS BY TROY THOMAS

Sure, you can cheaply build an intranet atop your current infrastructure. But soft costs add up fast. Piggybacking intranet expenses onto existing projects can provide solid grounding.

BY MICHAEL FITZGERALD

Call it the "infranet." It's the corporate infrastructure that underlies your intranets. Building it means far more than installing TCP/IP and a new server or two.

"You really can very cheaply and with very little infrastructure throw [together] an intranet," acknowledges Chris Lambert, an Internet/intranet consultant for Broadway & Seymour, Inc. in Charlotte, N.C. "The question is, how valuable is it?"

Most companies naturally have some of the pieces in place. So piggybacking an intranet on current or

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WHAT'S ONLINE
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Page 6

ANALYSIS

FIRM FOUNDATIONS

Continued from page 1

planned systems is a sound fiscal start. It's long-term maintenance and growth you have to plan for.

An intranet comprises both equipment and people, to support the users and develop interfaces and apps. Having a handle on both might determine whether your project succeeds or fails.

From the ground up

Beyond TCP/IP and user desktop systems, intranet managers say, a solid infrastructure includes:

- Bandwidth: the ability to handle increased network traffic.
- Support for users and the content they manage.
- Well-designed user interfaces and applications.

A solid yet flexible foundation is key because requirements change, says Rick Brennan, who directs Internet development at Sun Microsystems, Inc. Getting a free (or cheap) ride on another budgeted project is a common strategy for getting off the ground.

That's the method The Sharper Image used, says Vince Barriero, senior vice president and CIO. The San Francisco specialty retailer had long wanted to give store managers real-time access to corporate databases to speed ordering, cut inventory and boost customer satisfaction. Salespeople placed orders through a voice response system or uploaded them after hours for processing the next day.

Unfortunately, Barriero says, store transaction volume wasn't sufficient to cover the hardware and telecommunications costs needed to put in a dedicated server connected to the corporate database. "We could never cost-justify it," he says.

But by piggybacking it on a store systems upgrade project, Barriero got an intranet essentially for nothing. The upgrade cost $4,500 to $5,000 per store for new hardware and $100,000 total for software development, hardware deployment and telecommunications at the main corporate site. But the intranet was included essentially for free, Barriero says.

The Texas State Comptroller's Office is converting its SNA environment to TCP/IP and rolling out intranet applications as it goes, says systems analyst Ralph Hutchins.

The $50,000 price tag for the intranet pilot — including a dedicated new RS/6000, the software suite and con-

WHAT ABOUT SYSTEMS MANAGEMENT?

Entergy Services Co. has about 1,000 intranet users and no bandwidth issues so far. United Parcel Service has 4,000 intranet users and reports no slowdowns either. But neither company is using any systems management tools. So is your clogged — or crashed — intranet just a matter of time?

Perhaps it's systems management that's a matter of time.

Before you can use systems management tools, they have to be available. And before you can manage a system, a structure for doing so has to exist. As the often ad-hoc nature of early intranets matures, administration should follow.

"There is no [intranet] systems management being done so far," says Earl Perkins, manager of network projects at Entergy in Gretna, La. "It'll continue to be done in ad-hoc fashion until you treat these applications like an application, and you draw it under the systems management umbrella."

"A lot of people are living in a world of rudimentary system observation," says Michael Sullivan-Trainor, director of electronic commerce programs at International Data Corp. in Framingham, Mass. Most companies throw together an intranet with some HTML and CGI access code, he says, and "hope the whole thing doesn't crash."

Sullivan-Trainor says software packages and services to handle intranet site-monitoring are becoming more available. Web products from vendors such as Netscape, Net.Genesis, Secure Computing (WebTracker), and Microsystems Software (CyberSentry) are in this group. Traditional traffic management tools — CA Unicenter or HP OpenView, for instance — can be called into service as well.

Savvy intranet managers will pay attention — or pay the price of crashes and unreliable internal servers.

— Michael Fitzgerald

ANALYSIS

FIRM FOUNDATIONS

Continued from page 1

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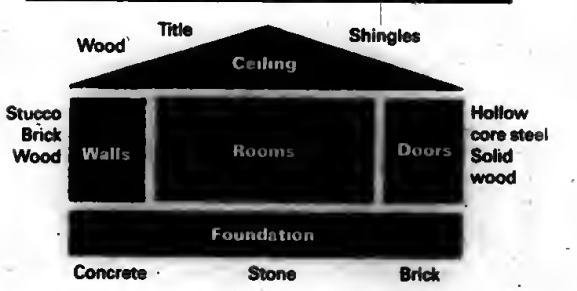
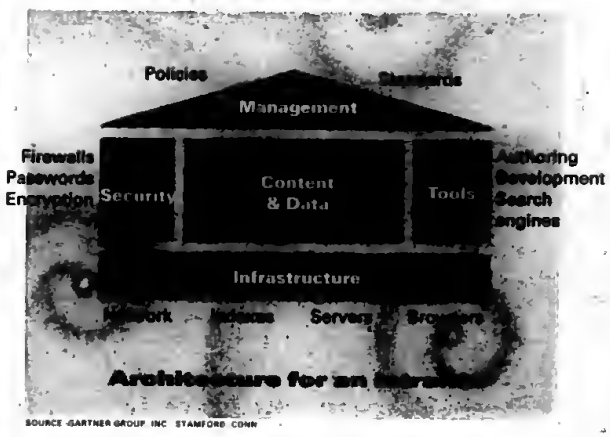
The components of an intranet lend themselves to a construction metaphor



Architecture of a house



SOURCE: GARTNER GROUP INC., STAMFORD, CONN.

sulting and programming costs — was largely absorbed into the budgeted migration project, Hutchins says.

At United Parcel Service of America, Inc., a huge intranet expansion will "hitch a ride" on a project to upgrade various router links to bandwidths as high as T1 speeds, says Joseph Lawless, project manager of Internet systems at UPS.

And much of the foundation for providing intranet access to 80,000 users, vs. the 4,000 now, by early next year is already there. UPS already has IP stacks on desktops running Windows 95 and Windows NT as well as on Novell, Inc. NetWare servers.

Lawless does predict usage costs will rise as more key corporate information goes online. "More and more people expect the data to be up," he says.

Bandwidth issues

On the networking end, surprisingly, one observer says intranet traffic needn't clog the pipes.

"For a company that's well-automated, [an intranet] will consolidate a lot of traffic," says Broadway & Seymour's Lambert.

But things can still back up on the server end. Many companies start intranets with low-budget, low-end servers, which choke when the companies post "fat" documents like human

Continued on page 4

ONLINE

- For profiles of the users in our analysis story, see our site at http://www.computerworld.com/intranets.

ALSO ONLINE THIS MONTH:

- Forum with Web consultant Michael Sullivan-Trainor of IDC

- QuickPoll: Intranet funding. Tell us: What do they really cost?
- Expanded interview with Chrysler CIO Susan Unger
- Unger's Top 10 Reasons to Create an Intranet
- Link into Chrysler's public relations site
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Continued from page 3

resources materials. Ironically, that can make it harder for employees to get documents online than off-line.

Plus, switching to TCP/IP can clog host processors. "We've noticed an increased load," says Texas systems analyst Hutchins.

TCP/IP makes the department's IBM mainframe a heavily trafficked network host, which sucks up processor cycles and runs less efficiently than under SNA. Plus, Hutchins says that because of the extra hits, the department needs to spend $20,000 for a second 3172 front-end communications controller.

UPS isn't taking any chances. It's expanding bandwidth to avoid future traffic jams, says project manager Lawless.

And to maximize uptime, it expects to offer full redundancy for its Web servers. It may even mirror the entire site, including support services, the domain name server (DNS) and the proxy server — 15 servers in all. "We need to determine what's crucial and what's nice-to-have," Lawless says.

Reliability is an issue at Hibernia National Bank in New Orleans, too. Its Vision 2000 project is part of a three-tiered client/server project. Asks Thad Hymel, the project's chief technologist, "How redundant is redundancy? Regionally? To the branches? We're beating our heads against the solution."

The bank will likely build in redundancy at the branch level, using Novell's NetWare IP 2, he says.

ADVICE

• Get end-user buy-in

"At a managers' meeting a few months ago, we put together a proof of concept for the intranet, and we got so much positive response. That was a big help. Once we go to upper management, they've heard about it, and it should make it a lot easier."

— Thad Hymel, Hibernia Bank

• Expect higher costs

"Costs are more toward the quadruple [of what you expect]."

— Joseph Lawless, UPS

• Beware of crunchies

"IBM's 3172 controller Model 3 offloaded some TCP/IP functions from the mainframe. But when a shop has more than 1,000 TCP/IP terminals hitting the controller, you get basically no response, or it would just crash. We had to stop using that software and use something called ICP, which loads everything back on the mainframe."

— Ralph Hutchins, state of Texas

• Set design principles

"When rolling out an intranet, make sure you have consistent look-and-feel and have templates. It's not enough to just say, 'Do it this way.'"

— Jakob Nielsen, Sun

Support issues

If hardware and even networking can sometimes be practically freebies, here's the hidden cost: support.

"A lot of people need help configuring a browser," notes UPS' Lawless.

UPS employs 20 people to support the company's intranets and a World Wide Web page that sometimes logs 350,000 hits a day.

Indeed, people resources are tapped from the get-go. Building an intranet means "everybody has to get involved: PC people, network people, etc., and a lot of that falls under ongoing support and maintenance," says Texas' Hutchins.

The development end can't be shortchanged, either. Developing a universal interface for intranet pages is arguably the most crucial intranet task: A large corporation could waste $1 million or more a year trying to locate material in departmental Web sites, says Jakob Nielsen, a human interface engineer at Sun Microsystems, Inc. Yet many companies skimp on interface design when planning the system.

"There's a physical infrastructure and an information infrastructure," Nielsen notes. He's just updated Sun's intranet interface, whose design had been overwhelmed since it was created two years ago. "We're trying to reimpose structure," he explains.

That's what an intranet is. It ain't an intranet for long without one.

— Fitzgerald is* Computerworld's *former online editor.

Resources

CONFERENCES

The Business Online Conference: An Executive Guide to Internet and Intranet Strategy. San Diego, Calif. Dec. 3–4. Features more than 20 sessions. Sponsors: Meta Group, OCI. Information/registration: (508) 470-3880, or E-mail ConfReg@dciexpo.com.

Resources

DEMOS

Still skeptical how your company could use an intranet? Visit Acme Fruit & Nut's site and see one in action. The home page offers company news and links to business units. Some functions are interactive. Includes a list of the software used in building it, too. http://foghorn.acmedia.com/

Resources

BOOKS: NEW TITLES

"Intranet Working" by George Eckel (New Riders Publishing, $35). "Running a Perfect Intranet" by Rick Casselberry (Que, $49.99). "Introducing Intranets" by Gordon Benett (Que, $24.99). To order: (800) 428-5331, or link via our online edition at http://www.computerworld.com/intranets.

Continued from page 3

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Netscape's James Barksdale on Informix.

James Barksdale
President and CEO, Netscape Communications

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PROJECT

Chrysler Corp.

Auburn Hills, Mich

$53 billion automaker

At Chrysler Corp. (http://www.chryslercorp.com), intranets are more than just a pretty interface. "You really need to focus on infrastructure," says CIO Susan Unger. "You'll need it."

To date, the automaker has seven major corporate intranets. One serves 6,000 engineers. Another enables activity-based costing for financial users. A third, built for public relations, extends into a public Web site for journalists.

Led by Unger, small teams are actively identifying gaps in Chrysler's enterprise infrastructure. "The hard part is knowing where the gaps are," she says. "Does it really warrant investment or not? We try to make a clear business case why it's important to have. It [isn't] just the intranet development for its own sake."

The company plans a 15% to 20% annual increase in network capacity, in part to handle intranet growth, she says.

ROLES

IS pays for infrastructure and networks. Application costs are split with user groups. Intranet development is decentralized; there are now seven developers. Joint/rapid application development, business process redesign methods are used. "The customer has to be the content owner. In some organizations, that's fallen on the shoulders of IS. Our responsibility is to provide the technology."

PEOPLE CHALLENGES

"Our biggest adjustment was 2½ years ago when we fully endorsed client/server. That was a huge training issue. We've gotten over that hurdle; this is almost easier to handle. We don't view training as a big problem. It doesn't take long to pick up the appropriate training. You can go in a week and become a webmaster. It's really exciting."

TECHNICAL CHALLENGES

Software that's poorly Web-enabled and difficult to integrate is a challenge. "When you start trying to hook up a number of software products, they don't work. You could probably do some integration if you really wanted to do that work. But do you?"

PAYOFF METRICS

Better cycle times, speed of delivery, improved quality are results. Another plus: speedy development. Time to create some apps was cut from six months to two weeks. "It's incredible. People had never done a Web site before, and it took a total of two months to entirely complete it — and that included the learning curve and specing it."

TOOLS

"We look at tools and how easy are they for my people to use and for the customer to use. If I have to throw them away a year from now, it's not a big problem."

PROCESS

"We did an intranet and Internet for our PR organization. It started with a really small target group and pilot group. We're now [reaching] up to over 300 journalists. As Chrysler information is released on the newswire, it's simultaneously relayed on the Web site, organized by subject areas, press releases, facts, biographies. Before building that, I had my people go out and watch [the PR people] work and follow the flow and what they were doing. We took that process."

LOTUS NOTES AND INTRANETS

Using an Internet/intranet system is cheaper and the developer skills are easier to learn than with other systems. "Netscape is more open. Lotus Notes is hard to administer but better than Netscape. Servers have been hard to administer. Directory services had been a nightmare. But it's not all that bad in the intranet environment."

EDI

"We require EDI on the buy side. For EDI on the sell side, it makes more sense down the road to go the Internet."

ADVICE

"You need to actively push the organization if they are not into it. The network is the computer; you really need to understand that from a development point. We're almost pushing our customers maybe more than they would like. You need a very iterative process in which you do things quickly and throw it away. This is a big change of mind-set."

— Joseph Maglitta

CHRYSLER CIO SUSAN UNGER: *"You need a very iterative process in which you do things quickly and throw it away. This is a big change of mind-set."*

PHOTOGRAPH BY MICHELLE AGHOIAN

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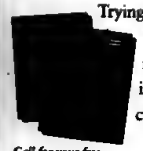

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–The Forrester Report
The Full Service Intranet, March, 1996

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For corporations planning to use internet-based technologies for internal use, [Netscape] SuiteSpot is shaping up as a better alternative...
–*PC WEEK*, May 13, 1996

Netscape's full range of intranet solutions provides greater functionality and costs less to implement than proprietary intranet solutions like Lotus Notes and Microsoft BackOffice. In fact, when Forrester polled professionally managed Web sites, 80% indicated they had chosen Netscape.

So call, or visit our Intranet Solutions site at home.netscape.com to find out for yourself. And breathe a sigh of relief.

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VISUAL BASIC

Hiring managers agree: Visual Basic promises to be the runaway top development tool next year

By William Spain

There seem to be only two constants in the information systems job market: the demand for skilled workers far outstrips the supply, and what's hot today may be frozen next week.

The trick for IS professionals is to stay on top of the career opportunities for various technology skills and to invest in the right ones. One skill that has been much in demand is Microsoft Corp.'s Visual Basic. And according to the forthcoming *Computerworld* survey of IS hiring managers, it will remain so for the immediate future. In fact, managers say it will be the most sought-after development skill. What follows is information on how to get it, what it's worth and where it might be going.

BY POPULAR DEMAND

"Demand for every IS skill is increasing at an exponential rate, and Visual Basic is right up there at the leading edge of it." — Shannon Brandon

From Atlanta to Dallas to Phoenix, the high demand for Visual Basic skills shows no signs of slowing, says Shannon Brandon, director of the professional services division at Matrix Resources, Inc. in Atlanta, a recruiter and consultancy with offices in the South and Southwest. Indeed, *Computerworld*'s annual skills survey [to be published Nov. 18] finds it will be the most hired-for development tool next year.

"We're seeing it all across the board — everything from manufacturing to banking to service organizations," Brandon says.

Add to the above most-wanted list all of the Atlantic Coast and the industrial Midwest, says Jack DeTurk, president of DP Job Works, an Indianapolis-based recruiter. As DeTurk sees it, IS professionals with Visual Basic skills can land jobs in everything from "manufacturing applications to account and financial applications."

SHOWS WHAT YOU KNOW

"Demand is increasing because of the ease of being able to put an application together. It also shows that you've got a background in visual programming, period." — John Kile

Part of the reason for the sustained high demand for Visual Basic is its ease of use and versatility, says John Kile, a systems analyst involved in hiring at Eli Lilly & Co. in Indianapolis.

"A lot of the skills are transferable. If you know Visual Basic, [it's easier] to use PowerBuilder or some other visual programming language." And "it's a good item to have on a resume," he says.

Peggy Martinus, Chicago branch manager at consultancy Greenbrier & Russel, says acquiring Visual Basic skills "is definitely a good career move. Some companies only use Microsoft skills."

PAYING THIS GAME

"Of the development tool skill sets, probably the highest-paying are Visual C++, Visual Basic and PowerBuilder." — Shannon Brandon

Investing in Visual Basic can certainly pay off in the weekly paycheck, Brandon says. "Visual Basic may not be the highest paid of the three, but it's right up there close to it," she says.

Computerworld's skills survey reveals that Visual Basic premiums paid to permanent staff range from 3% to 16% of salary, depending on the region and the nature of the work.

Bruce Masserman, a partner at Jersey City, N.J.-based Aux Technology, Inc., agrees. "There are a limited amount of people who have the wide variety of Visual Basic skills." But he says to command a salary premium, "you really have to have C++ or something else to go with it."

That premium may not come directly from an employer, however. There appears to be an increasing trend of firms going outside their ranks to fill their needs for Visual Basic skills. Contract consultants, according to the survey, can command salary premiums of 5% to 18%.

"As outsourcing continues to develop, the compensation level for what we like to call permanent employees probably gets pretty close to a standstill," DeTurk says. "Contracting inevitably drives internal salaries and wage increases down."

EASY TO COME BY

"Visual Basic is a tool that a lot people can pick up on their own. Individual programmers can buy the tool, and it's not expensive." — Peggy Martinus

There seem to be almost as many ways to come by Visual Basic skills as there are applications for them, from home study to on-the-job experience to formal classes.

Martinus says employers often foot the bill for training. But even when they don't, "it certainly isn't a hard class to come by," she says.

Brandon says most of his Visual Basic people "are younger. ... In general, our primary candidate base is [people who] just came out of school."

No matter how it's learned, it's clear that any investment of time or financial resources in Visual Basic will pay for itself in short order.

SEEING THE FUTURE

"Right now, the short-term demand is pretty hot. It is definitely still a tool of choice. But in three years, in two years, who knows?" — Bruce Masserman

Masserman says "short-term demand is still pretty good because of all the shops that went with [Visual Basic]. But as companies enhance those applications to the next level, some people will go with them, and others will be going the way of the Cobol people."

Keeping in mind the aforementioned constants of the IS world, it's difficult to tell what the long-term appetite for Visual Basic will be.

The near future is easier to predict because projects already under way rarely change horses in midstream, and companies that have made large investments in a particular tool are unwilling to jettison it too soon.

Brandon is a bit more confident. "We don't see demand slowing down any time soon." After all, he says, "having the Microsoft name tagged onto it doesn't hurt." ■

Spain is a freelance writer in Chicago.

VISUAL BASIC ONLINE RESOURCES

The Visual Basic Jobs Page
www.apexsc.com/vb/jobs.html
Features job postings and links to other resources.

Careers Online
www.colinc.com
Has job listings for permanent and contract work in various IS disciplines, including Visual Basic.

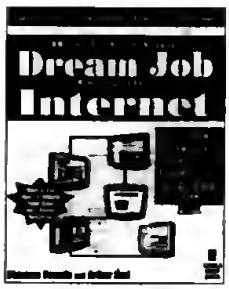
Recruiting-links.com
www.recruiting-links.com
Has a wealth of job links to employers.

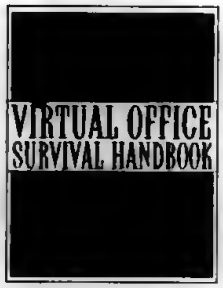
High-Tech Resources, Inc.
www.mindspring.com/hi_tech
Features a national technical search firm that specializes in data processing technologies.

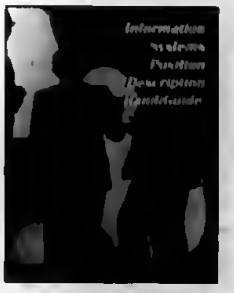
Net-temps
www.www.net-temps.com
Features a searchable jobs database with hundreds of Visual Basic postings.

By *the* Book

A variety of new titles for career-minded IS professionals







How to Get Your Dream Job Using the Internet

By Shannon Bounds and Arthur Karl
The Coriolis Group, Scotsdale, Ariz.;
350 pages, $29.99 (paperback).

It might seem unlikely that a book that uses about one-third of its pages to introduce the Internet would be all that useful to information systems professionals. But *How to Get Your Dream Job Using the Internet* not only covers the full spectrum of its topic, but it also covers it in depth and with great care.

The authors have a broader focus than technology alone. Bounds is a marketing professional with expertise in the Internet. Karl is a computer professional with personnel management experience. Together, they are the online career correspondents for the national radio show, *Log On U.S.A.* Therefore, the book goes well beyond simply providing Internet navigation advice. It emphasizes tips for using the Internet with all the human factors of real-world job hunting.

Chapter 5, "How to Create a Killer Electronic Resume," is a must-read. It's chock-full of cogent suggestions on presenting yourself via electronic mail, Hypertext Markup Language documents and traditional "snail mail" paper versions.

One specific suggestion: Avoid hard-copy resumes that are overly elaborate. Many companies use optical character recognition to scan resumes into a database, and unusual typefaces or extraneous design elements may make them unreadable.

The book also includes an ample selection of bulletin boards, uniform resource locators with job postings, listings of local Internet access providers and even an extensive tutorial on building your own World Wide Web page.

— Alan R. Earls

VROOM! Turbo-Charged Team Building

By Michael Shandler and Michael Egan
Amacom Books, New York;
160 pages, $14.95 (paperback).

The biggest asset and worst fault of this book are the same thing: It's a comic book with all the appeal and limitations of that medium.

You have to admire the audacity of the authors. They've taken a potentially dry subject and made it interesting by presenting it as a comic-book adventure.

In it, Harry Black is a beleaguered second-tier manager at Electromotion, which is trying to develop a high-powered battery for electric cars. But things aren't going well, and Harry gets the word from the boss that he's got a year to shape things up. Harry's solution is to create work teams. And it's through Harry's attempts to sell the team concept to the colorful members of his management group that the reader learns how teams are created and what makes them work.

There's great detail here, ranging from how to get people to buy in to the team concept to how to take personal responsibility for making teams work. Because it's a story, the book doesn't lend itself to browsing. The authors' accomplishment is that you will be interested enough in Harry's struggle to read the whole book, which is simply but gracefully written.

Information systems team members and managers can benefit from learning some of the basic requirements for making teams work. For example, team members need to be involved in making key decisions, and managers need to lead, not control, the team. Overall, this is an engaging introduction to team building. But it's too optimistic to be a practical guide to solving team-related problems.

— Steve Alexander

The Virtual Office Survival Handbook

By Alice Bredin
John Wiley & Sons, Inc., New York;
260 pages, $16.95 (paperback).

Whether you are self-employed and work at home already or you work in a more traditional setting, this book offers lots of good ideas about an increasingly common way of life. Indeed, according to Bredin's sources, the 40 million people who already work at home at least some of the time will be joined by another 20 million virtual office mates by the end of 1998.

Professionals in areas such as sales were often first to escape from the corporate cubicles. Computer professionals, obviously well-versed in the technologies of virtual offices, aren't likely to be far behind.

But working in a virtual office demands new skill sets. Bredin, a writer who became fascinated by the phenomenon of the home office, has become a recognized expert on the subject. She writes a nationally syndicated column called "Working at Home," provides commentary on public radio's *Marketplace* show and hosts online forums on America Online and The Microsoft Network.

This thorough book omits little for someone considering home office options or seeking to make the experience successful and satisfying. Bredin discusses, for example, the personal characteristics needed to work amidst the distractions of home. She offers dollars-and-sense arguments and action plans for persuading bosses to lengthen the umbilical cord and let you work out of sight.

Even the bibliography is organized in a useful way: by chapter topics. So if you need more information on, say, organizing your office, Bredin suggests appropriate additional resources.

— Alan R. Earls

Information Systems Position Description HandiGuide, Revised Edition

By M. Victor Janulaitis
Positive Support Review, Inc., Santa Monica, Calif.; 445 pages, $395; $795 for book and electronic versions; $895 for book and network electronic versions; shipping costs additional; $16.50 unless purchase is prepaid (paperback).

This book was designed to be used rather than read. It consists almost entirely of job descriptions for IS employees. It primarily targets corporate hiring managers and human resources professionals interested in spelling out what everyone's job is supposed to be.

The writing is clear and concise. As a result, this book will be invaluable to IS executives who want to fine-tune their organizations so that responsibility is sharply defined and performance is accurately measured.

Author Janulaitis, CEO of management consulting firm Positive Support Review, Inc. in Santa Monica, Calif., said in an interview that the book aims to fill a demand for better job descriptions. The book contains descriptions of 132 IS jobs, ranging from chief information officer to word processing operator.

The book describes each job's purpose, problems, essential functions, authority and educational requirements. It also explains whom the job holder will interact with in the corporation and what promotion opportunities exist. Career progression and compensation are two of the key reasons to pay close attention to job descriptions, Janulaitis says.

— Steve Alexander

Earls is a freelance writer in Franklin, Mass. Alexander is a freelance writer in Edina, Minn.

PROGRAMMER ANALYST (2 openings) Plan, develop, test & document computer programs, applying knowledge of programming techniques & computer systems; evaluate user requests for new or modified programs to determine feasibility, cost & time req'd, compatibility with current system & computer capabilities, consult with users to identify current operating procedures & clarify program objectives, formulate plan outlining steps req'd to develop program using structured analysis & design; convert project specifications using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by computer; apply knowledge of computer programming techniques & computer language analysis, design & development for enhancement & maintenance of system redesign modules, requirement analysis, data flow analysis & database design, administrating the production database, debugging & testing & using each of the following: VAX 10000/4000, HP 9000, VAX/VMS, VAX Rdb 4.1, POWERHOUSE, VAX C, VAX-SET, SQL, SQLPLUS, HP-Unix & KSH & Oracle. Reqr Bachelor's degree in Computer Science, Information Systems, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equiv in ed & exp.; 2 yrs. exp. in the job offered or 2 yrs. exp. in a related occup. such as Programmer, Programmer Analyst, Systems Analyst, Analyst CUM Programmer, Project Trainee, Software Engineer, Software Professional or Consultant. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the reqd. ed. & exp. Must have some related exp. including data flow analysis & database design, debugging & testing & using each of the following: VAX/VMS, VAX Rdb 4.1, POWERHOUSE, VAX C & VAX-SET. $42,940/yr. 40 hrs/wk, 8a-5p. Send resume to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202 & include Ref. #119586. Employer Paid Ad.

APPLICATION PROGRAMMER: Develop, or integrate purchased, dynamic link libraries (DLLs) for state of the art investment analysis software used by quantitative investment analysts in institutional investment companies, investment marketing professionals, personal financial planners, and retail stock brokers. A goal of the software is to provide the user with state of the art tools which provide graphics and statistics in an integrated form so the graphics become not just a display, but a key data analysis tool. The position requires object oriented design and programming in computer graphics, algorithms, database, and statistics. Programming will be in Microsoft Windows NT on PCs using Borland C++ for Windows Object Windows Libraries. Must have: 1) M.S. degree in computer science and 2) completion of one graduate course each in: Business Computer Technology, Computer Algorithms, Numerical Analysis, and Statistics (Probability); and one course covering object oriented design and programming using Borland C++. $45,000/yr, 40 hrs/wk, 9-6. Must have proof of legal authority to work permanently in the U.S. Send 2 copies of both resume and cover letter, and [illegible] to: Illinois Department of Employment Security, 401 S. State Street - 3 South, Chicago, IL 60605. ATTN: LEILA JACKSON. Ref. #V-IL-15328-J. No calls. An Employer Paid Ad.

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SYSTEMS DEVELOPER-OBJECT ORIENTED DATABASES TAMPA, FL, 8:00A.M. - 5:00P.M. Will plan, develop, test and document computer programs, applying knowledge of programming techniques and computer systems. Will evaluate user request for new or modified program, such as financial, human resources management, clinical research, trial results, statistical study of traffic patterns, or analyze and develop specifications for bridge design, to determine feasibility, cost and time required, compatibility with current system, and computer capabilities. Will consult with user to identify current operating procedures and clarify program objectives. Will also read journals, periodicals, and technical reports to learn ways to develop program that meet user requirements. Will formulate plan outlining steps required to develop program, using structured analysis and design. Will submit plan to user for approval and prepare flowcharts and diagrams to illustrate sequence of steps approved. Will also design computer terminal screen displays to accomplish goals to user request and enter program codes into program. $60,000/annually. Special requirements include two years experience with C++ [illegible] Oriented Technology and a Masters Degree in Computer Engineering. Send Resume to: Job Service of Florida, 2312 Gulf-to-Bay Boulevard, PO Box C, Clearwater, Florida 34618-4060. Refer to Job No. FL-1511073.

Advanced Digital Media Designer Develop multimedia user interfaces & navigation design for kiosk and on-line applications; prepare, produce, service demo diskettes, participate in interactive sales and corporate presentations, CD-ROM title development (education & entertainment) 3-D modeling/rendering, 2D & 3D animations, 2D and 3D illustrations, some Scripting, lingo and programming, digital video creation & integration, web pages design & knowledge of HTML, graphic design, digital imaging in packaging design, project concept development in ideation, storyboarding and prototyping. Masters in Computer Graphic Design or equivalent. Minimum 1 yr's exper. in/with graphic production, 3D modeling/rendering and animation package Macromedia Director (animation/scripting, authoring software); SoundEdit; research on or development of CD-ROM games; Macintosh computers, peripherals Adobe Photoshop in plug-ins, Adobe Premiere (digital video editing), Macromedia FreeHand/Adobe Illustrator (above experience may be gained concurrently and may be gained in either academic or work setting). $37,000 per year 9 am to 5 pm. Apply to nearest Job Service Office or submit resume (with Soc. Sec. #) to Job [illegible] Street, Greensboro, NC 27406. Reference Job Order #NC4061314 and DOT code 142.061-026

Programmer/Analyst (Jacksonville, FL client site; subsequent placements throughout Florida) Analyze, design, develop, code, test, implement, and maintain programs for commercial and financial applications systems, using COBOL, CICS, and ASSEMBLER in an IBM mainframe environment. Bachelor's Degree in Comp. Sci., Engin., or Math + 1 yr. exp. in job. $37,500/yr. 40 hr/wk, 9 a.m. - 5 p.m. Send resume to: Job Service of Florida, 2080 West Oakland Park Blvd., Ft Lauderdale, FL 33311-1347. Re: JO# FL-1510526.

Senior Consultant. Design, develop, implement & test software for Management Information Systems in the areas of not-for-profit, finance and education. Tools: Visual C++, PowerBuilder, Sybase, SQLServer, Watcom, PC's, Macintosh, SUNSPARC, UNIX, VAX/VMS. M.S. in Computer Science (M.S. in any engineering field is also acceptable) as well as 6 mths. experience in job offered or as Research Assistant required. Previous experience must include relational database, SUNS/PARC, UNIX. 40 hrs/wk, 9am-5pm, $50,000/yr. Must have proof of legal authority to work permanently in the U.S. Send resume to: Susan M. Fuller, Director of Human Resources, 5 Revere Dr. Ste 540, Northbrook, IL 60062-8007 847/480-9800.

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Careers

City of Portage

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The City of Portage, a progressive municipality located in Southwest Michigan, is seeking a highly qualified individual to fill the position of Management Information Systems Director. This professional managerial position is responsible for operations of the city computer systems, information system and implementing advancing technologies. The ideal candidate will have a strong background in mainframe/mini computing and programming (AS/400 RPG400) and network PC's (LAN - Novell Netware). The successful candidate will have demonstrated problem solving and planning skills, and comfortable operating in a demanding environment. Bachelor's Degree in Business or Computer Science, Master's Degree preferred. Work experience in the public sector is a plus. This position offers a salary range of $52,184 to $73,058, and an excellent fringe benefit package. Qualified candidates send a resume and letter of application including salary requirements to:

Director of Employee Development
City of Portage
7900 South Westnedge Avenue
Portage, Michigan 49002
EOE

COMPUTER SOFTWARE Field Technical Support Analyst. Provide on-site tech support of Oracle RDBMS & related s/w for customers w/ large complex dev. & production environments. Solve problems & provide proactive solutions regarding Oracle RDBMS internals, data warehousing, parallel systems, critical recoveries, & OLTP apps in distributed environments. A wide range of computers & networks. Assist prgmmrs & MIS professionals in using 4GL tools. Plan backup & recovery systems & schedules. Tune system & train users. Must have BS in Comp Sci, Info Systems, or Engineering (any field) & 2 yrs. exp. in dev or support of Oracle RDBMS systems in a dist. Unix environment. Exp must include Oracle RDBMS internals & tools, critical recoveries, VLDB DBA, parallel servers, OLTP apps in dist environments, implemtn on TCP/IP networks & Unix system prgrmming. 3 openings. Job site: Dallas area. $6163/mo. Resume to: CW-184666, Computerworld, Inc., PO Box 9171, Framingham, MA 01701-9171

Systems Analyst (Consultant) Develop custom business information systems based on Oracle relational database software & RDBMS applications development tools. Analyze clients' business info flow reqs. formulate data & function models, define reqs. & design & develop custom applications using RDBMS tools (forms & reports) & C/C++. Implement on UNIX open systems & networks. Dev integration & acceptance test plans. Tune apps, systems & train users. Must have BS/CS or equiv (BS in another computer-related field or 5 yrs. software dev exp.) & 2 yrs. exp. in analysis & devlpmnt of Oracle RDBMS business systems in a distributed C/C++/Unix environment using CASE & RDBMS tools (incl. forms & reports). 3 openings. Job/interview site: Bloomington, MN. $4333-$5210/mo. Resume to: CW-184684, Computerworld, Inc., PO Box 9171, Framingham, MA 01701-9171

SOFTWARE ENGINEER Design, develop, debug, test, support a line of industrial input/output driver software, targeted to the end users of the Visual Logic Controller (VLC). MS Degree in Computer Science or Electronic Engr. or Computer Engr. two yrs. exp. as Programmer Analyst must have included work with Microsoft SDK, Visual C++, MFC, WMX, in real time environment. $45,500/yr., 40 hr. wk./9am-5pm. Resumes to: 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref # 120896. Employer paid ad.

Software Development Engineer. Will create, develop, implement, and modify a multimedia (picture and data) computer-based image processing systems which allows storage in a PC-based computer of video images of various jewelry for purposes of establishing a catalog of inventoried items for use by members of jewelry industry. Will insure that systems allow saving of images in full motion in a MPEG file format, including motion device sensor which will be controlled by capturing software systems in addition to saving still pictures in a JPEG file format. Will establish system to insure video output and input are on a RGB base and that picture quality will meet 24 bit picture standards. Will create and develop a catalog on CD-ROM including graphic programming for high resolution pictures. To insure receipt of such 24 bit picture and establishment of a database to allow individual jewelers to create a customized database concerning price, quality and other market factors. Will implement such systems for use in Client/Server platforms using a MS/SQL Server and Windows NT. Requires Bachelor's degree in Computer Science. Also requires two years experience in the job to be performed. Hours: 8:00 a.m. - 5:00 p.m. 40 hours per week at $80,000 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send resume to: Israel Levy, President, Levy Corporation, 29 East Madison Street, 7th Floor, Chicago, Illinois 60602. No Calls.

Programmer. Programs, tests, codes, develops, and modifies a financial information relational database system for use in the banking industry. Uses JCL and COBOL and other programming languages including C in a UNIX environment to develop and program modules in a banking financial information operating system which is installed on an IBM DB/DC MVS mainframe environment. Requires B.S. degree in Computer Science or Math or Statistics with a Minor in Computer Science. Also requires six months experience in the job to be performed. Education to include completion of one course in: Management of Information Systems, Data Management System and, Management System Design and Implementation. $32,000.00/yr. 40 hrs. week, 9:00 AM - 5:00 PM. Two copies of resume to: Mike Brooks, DWELALC, PO Box 7972, Madison, WI 53707-7972. Please reference case #9603337 on application materials.

Systems Engineer wanted to provide consulting services in the form of UNIX system upgrades and application support for the CATIA software system, provide expertise relating to system installation support and training and software system customization. Reqs. M.S. in Computer Science or Mech. Engineering and 18 mo. exp in the job offered or 18 mo. related exp. as CAD/CAM Engineer and exp. must include installation and support of IBM CATIA software system on UNIX workstations, 40 hrs/wk; 8 am - 5 pm; $46,000/yr. Send resume to: 7310 Woodward Ave., Room 415, Detroit, MI 48202, Reference No. 120496, "Employer Paid Ad."

Information Systems Consultants

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Our Information Systems Consultants help clients add value to their businesses with strategic and tactical planning for information systems, to anticipate the challenges and opportunities of systems advancements and global change. Specifically, this involves evaluating, selecting, implementing, and supporting application packages and platforms. Your qualifications must include a degree in Computer Science or other information systems-related degree, at least 3+ years experience, and an understanding of PCs, mid-range systems networking, and financial & operational information systems. Experience leading information systems planning, design, and implementation projects is also essential. Experience in several of the following: DOS, Windows, Netware, UNIX, AIX, OS/2, NT, TCP/IP, Progress, SQL Server, and MANF.

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PROGRAMMER/ ANALYST

Growing consulting firm specializing in health care software is looking for programmers w/4yrs. to 2 yrs exp in COBOL on an IBM mainframe with VSE/ESA. Please send current resume to:

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- Good analytical skills.

Preferred Qualifications include:
- Technical skills in Microfocus Cobol, Personal Oracle 7, Developer 2000.
- Java, JavaScript, C, C++ is a plus.
- Experience in a team development environment.
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Software Engineer. 40hrs/wk, 8:00am-5:00pm. $44,600/year. Apply database, statistic engineering theory, using Oracle "DBA, Oracle" ProC, Oracle "OCI, Oracle" Form, C++, SAS to design and develop marketing database of credit card system for clients under UNIX environment. Qualified applicant must have BS and MS of Computer Science, take one year full-time industrial working experience for financial database in U.S.A. (1 year exp in job offered or related job such as programmer analyst). Applicant must have proof of legal authority to work permanently in the U.S. Send resume and cover letter to: Orsitech Inc., suite 172, 500 South Rt. 59, Aurora, IL 60504. Attention: Karen Gleason. An Employer Paid Ad.

Systems Analyst (Metro Detroit) Analysis, design, development & performance of ORACLE relational database systems using ORACLE CASE tools, DESIGNER 2000, DEVELOPER 2000, VISUAL BASIC & C++ under UNIX SOLARIS operating system in WINDOWS NT client-server environment. $72,000/yr. Requires Master's in Comp. Sci. or MIS & 1 yr. exp. in job offered. Send resume describing qualifications to Mike Williams, Interactive Business Systems, Inc., 17187 N. Laurel Park Drive, Suite #150, Livonia, MI 48152

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Hotel Nikko, San Francisco, California

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7:30am **Continental Breakfast & Conference Registration**

Concurrent Sessions:

Candidate Selection: How to Pick the Right People
Dr. William Swan, President, Swan Consulting

The Critical Importance of Soft Skills and the "Invisible Assembly Line"
Todd Schmick, Priority Management Systems, Inc.

Immigration Issues
David P. Berry, Esquire, Berry & Appleman

Proactive Recruitment Techniques
Dave Drugman, President, Bay Cities Research, Inc.

12:15pm **Luncheon Keynote: Industry Trends**

Repeat of Concurrent Sessions

Town Hall Forum
John Younger, President, y-net

6:00pm **Program ends**

Selected sessions include:

Proactive Recruitment Techuiques
Dave Drugman, President, Bay-Cities Research, Inc.

To remain competitive, today's technical recruiters need to be aware of the latest trends in sourcing and proactive recruiting. This in-depth session from a leading expert will explore this critical topic and will help you put your resources and expectations into proper perspective.

Town Hall Forum
John Younger, President, y-net

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SOFTWARE ENGINEER required. Design/development of Decision Support Systems in client/ server architecture using object oriented methods. Programming using Smalltalk, COBOL & GUI development tools including Visual Basic & SQL*Forms. Database administration & tuning. SQL tuning & database design using Oracle7 & Oracle Utilities (SQL* Loader, Pro*C, Pro*COBOL, etc.) on UNIX platforms & DB2/2 databases with REXX & SQL utilities on OS/2 platforms. Master degree or its equivalent required in any Computer Intensive Curriculum such as Math, Computers, or Engineering plus 1 year experience in the job duties described above. Must be willing to relocate to various unanticipated work sites throughout USA every 4 to 10 months-Employer Paid. Must have proof of legal authority to work in the U.S. Salary-$48,000/ year for a 40 hour work week. Interested applicants submit resume to Job Service of Florida, 2680 West Oakland Park Blvd., Ft. Lauderdale, FL 33311-1347. Re: Job Order Number FL-1509401. Ad paid by an Equal Opportunity Employer.

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Consultant. Design, develop, implement & test software applications for management information systems. Database design. Use the following tools: ORACLE (including Forms and Reports); UNIX, C, C++, Visual Basic, SQL, System Administration Manager (SAM), Softbench, OS/2 & TCP/IP. Requires M.S. in Computer Science, Electrical Engineering, Math or Physics plus 6 months exp in duties described above or 6 months as Programmer, Programmer-Analyst or Graduate Assistant. Previous exp must include: UNIX, C, C++, Visual Basic & OS/2. Salary: $56,089 per year. Work 9AM - 5PM, 40 hours per week. Applicants must be authorized to work in the United States. Resumes to G. Minor, Alabama State Employment Service, P.O. Box 59482, Homewood, AL 35259-9482. Refer to Job Order Number AL 6921847. E.E.O.

Software Designer. Design, develop, implement & test software applications for management information systems. Analyze software requirements & perform feasibility studies. Graphical user interface design. Tools: Fisgro in multi-user LAN; OS/2; remote communications with Procom, DCAF & Netremote; cross-platform HLLAPI calls to IBM 3080 & IBM AS/400; Novell; batch unattended programs. M.S. in Computer Science as well as 1 yr exp. in job offered or as Programmer Analyst required. Previous exp. must include: Fisgro application programming in multi-user LAN, OS/2 environment; GUI design; remote communications with Pro-Com, DCAF & Netremote; cross-platform HLLAPI calls to IBM 3080 & AS/400; batch unattended programs. 40 hrs/wk, 9am-5pm, $42,500/yr. Send resume to Marcia Newman, Metamor Technologies, 1 N. Franklin, Chicago, IL 60606. (800) 466-6301

Systems Consultant. Analyze, design, develop, implement & maintain healthcare business applications. Work with IBM mainframe and client/server platforms utilizing mainframe FOCUS/PC FOCUS, TERADATA ROMS, TSO/SPF, JCL and SQL. Interact with client & in-house developers for clarification & other issues. Associate degree in Applied Science or Computer Science as well as 3 yrs. experience in job offered or as Programmer/Analyst required. Previous 3 yrs of experience must include work with: FOCUS on mainframe & PC platforms, TERADATA, JCL, TSO/SPF & SQL for healthcare business systems. 40 hrs/wk, 9am-5pm, $46,000/yr. Must have proof of legal authority to work permanently in the U.S. Send resume to: Daniel Burns, Innovative Systems Group, 799 Roosevelt Road, Building 4 #108, Glen Ellyn, Illinois 60137 (630) 858-6650.

PROGRAMMER, M.S. in Comp Sci/EE/Ind'l Eqr. Plan/dvlp/test/ install/doc comp pgms, applying know of pgmming tech, & comp sys. Evaluate user request for new or modified pgms to determ feasibility/cost/time, compatibility w/current sys, & comp capabilities. Consult w/user to id current operating procedures & clarify pgm objectives. Evaluate users production planning & inventory mgmt issues by applying optimization tech. Site pgms used include: Intergraph Micro-Station, Oracle, ESQL, MDL, C, C++, UNIX and SAS & Simnet Simulation Languages. Warehouse Inventory Management Software Development. F/T; $37.5k/yr. Proof of legal right to work in U.S. req'd. Mail resume w/dtd copy to Job Serv of FL, 2312 Gulf-to-Bay Blvd., P.O. Box C, Clearwater, FL 34618-4080. JO# FL-1907392.

Consultant. Design, develop, implement & test software for management information systems. Tools: Informix; ESQL; C, C++; UNIX; DOS. B.S. in Computer Science or Computer Engineering as well as 2 yrs exp. in job offered or as Programmer Analyst required. Previous exp. must include: Informix; SQL; C; C++; UNIX. 40 hrs/wk, 9am-5pm, $54,000/yr. Send resume to: Amit Jain, Computer Discoveries, Inc., 2306 Sudbury Lane, Geneva, IL 60134. (630) 208-1373.

Software Engineer. Research, design & develop software test procedures for scientific statistical software in a variety of computing environments. Tools: QA Partner; C/UNIX, DOS, Windows, Macintosh; VAX/VMS, Visual C/C++, Visual Basic; Visual Test; OLE Automation, MKS, MFC, ClearCase. Rational. M.S. in Computer Science as well as 6 mos. exp. in job offered or as Software Test Engineer required. Previous exp. must include: software testing using QA Partner; C/UNIX. 40 hrs/wk, 9am-5pm, $60,000/yr. Must have proof of legal authority to work permanently in the U.S. Send resume to: Wheeta Hudson, SPSS, Inc., 444 N. Michigan Ave., Chicago, IL 60611. (312) 329-2400.

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Career Survey: Software Related Services

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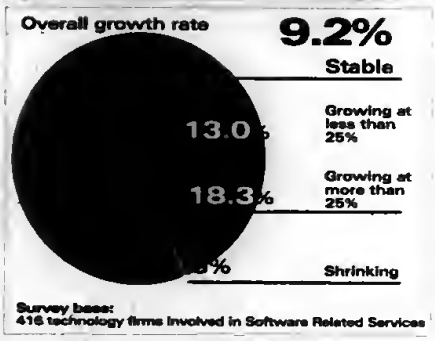

Survey base:
416 technology firms involved in Software Related Services

Survey conducted between July '96 and September '96.

Regional Growth Analysis

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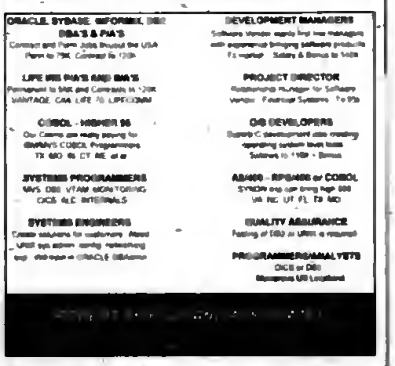

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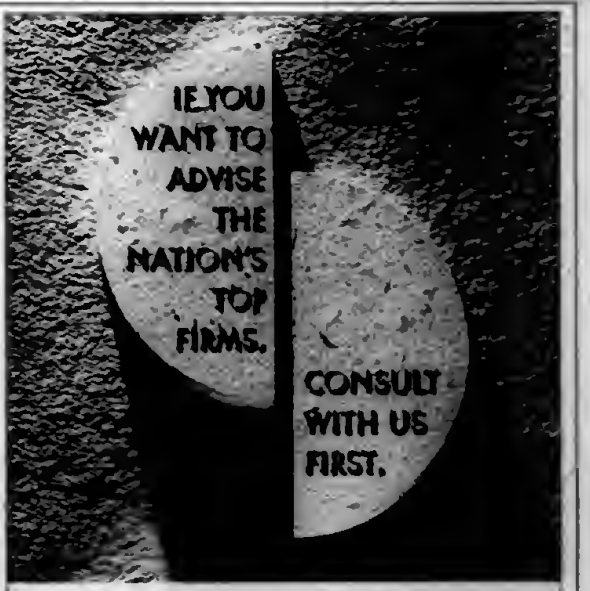

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	Proactive Recruitment Techniques Dave Drugman, President, Bay Cities Research, Inc.
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TECHNOLOGY ROUNDUP

Marketplace

Switching: Next stop for Token Ring sites

By Lynn Haber

Token Ring customers are switching. Rather than battle congested networks and slow throughput, Token Ring sites are following on the heels of their Ethernet counterparts and buying switch technology to revitalize their network infrastructures and maximize their investments.

About a dozen vendors are vying for a piece of the world's Token Ring switch market, which is expected to reach $255.9 million by year's end, according to Dell'Oro Group, a market research firm in Menlo Park, Calif. But the market is tapering off; it is limited by competing technologies such as switched Ethernet, according to Dataquest, a market research firm in San Jose, Calif.

Breaking up bottlenecks

Token Ring switches let organizations segment their networks or structure them into a series of logical networks. That relieves congestion on the backbone or bridge, the most common throughput bottleneck in a Token Ring network. Network managers install Token Ring switches to further microsegment departments or workgroups or to increase bandwidth among servers.

Token Ring customers turn most often to a half-dozen leading vendors for switches: Bay Networks, Inc., Cabletron Systems, Inc., Cisco Systems, Inc., IBM, Madge Networks, Inc. and Xylan Corp.

But there's a lot of overlap among vendors' products, and the overall direction of the Token Ring switch market is unclear as vendors engage in cross-technology licensing agreements, buyouts and OEM deals.

For example, Cisco just completed its purchase of Nashoba Networks, Inc. Earlier it inked a deal to jointly develop products with Olicom USA, Inc. in Plano, Texas. Cisco sells its own switch, resells an IBM Token Ring switch and, until recently, resold a Madge Token Ring switch.

The good news from this veodor consolidation is twofold for Token Ring customers.

There are many high-quality, high-performance products from which to choose, and switch pricing has fallen and is expected to continue its slide, says Kevin Tolly, president of The Tolly Group, a consultancy and testing laboratory in Manasquan, N.J.

"Price should be a key determining factor for anyone in the switch market today," he says.

Basic features and functionality in Token Ring switches include the ability to handle eight to 12 ports; accommodation of 4M and 16M bit/sec. Token Ring; support for full-duplex Token Ring; and high-speed uplinks to technologies such as Fiber Distributed Data Interface and Asynchronous Transfer Mode.

THE TOP SIX TOKEN RING SWITCH VENDORS

Products are listed in order of market share

BAY NETWORKS, *Santa Clara, Calif.*
TEL: (800) 222-7611
INTERNET ADDRESS: www.baynetworks.com
MARKET SHARE: 42.1%
PRODUCTS: Centillion 10 Token Ring Workgroup Switch, starts at $6,295; Centillion 100 LAN/ATM Switch, starts at $1,995.

IBM, *Research Triangle Park, N.C.*
TEL: (800) IBM-CALL
INTERNET ADDRESS: www.raleigh.ibm.com
MARKET SHARE: 18.1%
PRODUCTS: 8272 Nways Token-Ring LAN Switch, Model 108 (eight ports) $5,600; Model 216 (16 ports) $9,995; 8252 Campus LAN, (4-port Token Ring UTP/STP module, includes base unit) $11,290.

MADGE NETWORKS, *San Jose, Calif.*
TEL: (800) 876-2343
INTERNET ADDRESS: www.madge.com
MARKET SHARE: 12.3%
PRODUCT: Smart Ringswitch, $1,079 per port.

CISCO SYSTEMS, *San Jose, Calif.*
TEL: (800) 553-NETS
INTERNET ADDRESS: www.cisco.com
MARKET SHARE: 11.7%
PRODUCTS: Catalyst 1600, eight ports, $16,600; Catalyst 2600, 16 ports, $9,995; Catalyst 1200, eight ports, $9,995.

CABLETRON SYSTEMS, *Rochester, N.H.*
TEL: (603) 332-9400
INTERNET ADDRESS: www.cabletron.com
MARKET SHARE: 7%
PRODUCTS: ATX multiprotocol LAN Switch; 20 ports (four ports per card, five slots) of Token Ring switching would cost $1,700 per port. Other configurations available.

XYLAN, *Casablancas, Calif.*
TEL: (800) 99-XYLAN
INTERNET ADDRESS: www.xylan.com
MARKET SHARE: 5%
PRODUCT: PizzaSwitch TR, 20 ports, $579 per port; OmniSwitch series Token Ring switch module, six ports, $1,400 per port.

Source: Dell'Oro Group, Menlo Park, Calif.

Pricing among vendors' Token Ring switches varies, mostly because IBM and 3Com Corp. dropped their per-port pricing into the $500 to $600 range. Other vendors' products average $900 per port or higher.

Price drop

Analysts expect per-port prices to drop to the $300 range next year. Vendor competition and alternative techoologies are fueling price erosioo in the Token Ring switch market.

"Companies that are installing new networks are installing switched 10M bit/sec. Ethernet and 100M bit/sec. Ethernet," says Trudy Barker, a principal analyst at Dataquest. Some companies with Token Ring networks will make the leap from Token Ring networks to Ethernet networks. But more firms are likely to install Token Ring switch technology for many years to come, Tolly says. As the price per port for Token Ring switches approaches that for Ethernet — in the $200 range — customers have less incentive to migrate to Ethernet.

"Trading in a Token Ring network for Fast Ethernet isn't as easy as it sounds because the two technologies have different frame formats, which makes bridging between them difficult," Tolly says. ■

Haber is a freelance writer in Norwell, Mass.

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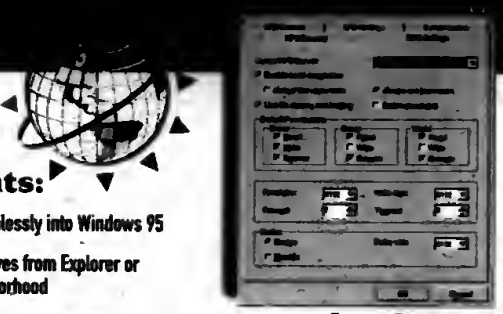

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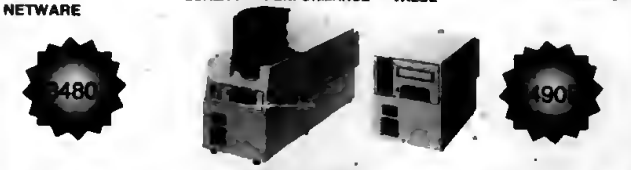

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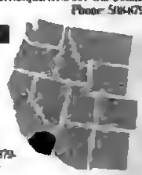

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Senior District Manager: Darren Ford; Sales Assistant: Brenda Shuman; 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (972) 233-0982 FAX: (972) 701-9008 Hearing Impaired: (800) 922-4918

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Midwest: Regional Manager/Pat Powers, 1011 East Touhy Avenue, Suite 550, Des Plaines, IL 60018 (847) 827-9437; Account Executive/ Nick Burke (800) 343-6474 TDD: (800) 227-9437

Southwest: Regional Manager/Ellen Cross, 4651 Dallas Parkway Ste. 304, Dallas, TX 75240 (972) 726-9785; Account Executive Jim Parker, (800) 343-6474

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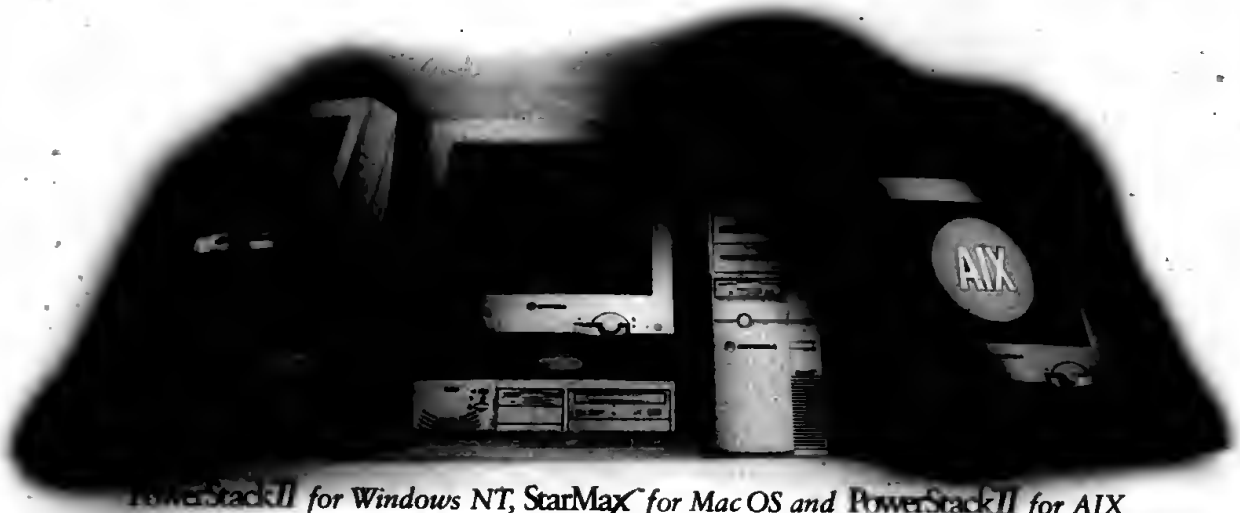

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Next week:
Internet funds off to a good, but quiet, start

Finance & Investing

Opportunity knocks

Wall Street sees big potential in data warehousing

▶ By Rosemary Cafasso

There's nothing easy about data warehousing, as most information systems pros will tell you. But from Wall Street's perspective, that sounds like opportunity knocking.

This is based on a simple formula: Because data warehousing efforts can be problematic, IS will continue to need tools to help get the job done. Warehousing can be complex, time-consuming and expensive. Typically, companies have stored data — often obsolete, redundant or flat-out wrong — in production systems for years. Getting that data out of those systems, cleaning it up and storing it in new databases is no easy task.

But that means the warehousing market will continue to grow and sustain a slew of suppliers, and that's good news for investors.

Data warehousing involves the creation of databases for end users. The idea is to deliver corporate information into the hands of users to help them make quicker, more intelligent decisions. The warehousing market is expected to hit nearly $5.5 billion in worldwide revenue by the year 2000, according to International Data Corp. in Framingham, Mass.

For an investor, there is a wide range of investment opportunities because the market has attracted such a variety of companies, from industry stalwarts such as IBM and Hewlett-Packard Co. to a plethora of upstarts such as Arbor Software Corp., an online analytical processing software vendor that went public earlier this year.

Yet analysts caution that investors still need to tread carefully. Charles Phillips, enterprise software industry analyst at Morgan Stanley & Co. in New York, stresses that the data warehousing opportunity doesn't mean easy money. "Do your homework," Phillips advises. "Just because data warehousing is a hot theme, don't go in blindly. It is dangerous to try to ride themes. Know the companies you want to invest in."

Phillips and other analysts note that there are various investment approaches to consider for this market. Here's a look at three options:

- Make a conservative play: Select established database companies such as Oracle Corp. The company isn't a pure data warehousing stock, but it is a safer bet than some of the niche players because it has such a wide range of warehouse tools and is strong in markets outside of this arena, as well.
- Target some warehouse-specific stocks, but be careful. There are actually only a handful of publicly held warehousing companies, and performance has been all over the map.

For example, earlier this month, two warehousing firms released dramatically different financial results in a 24-hour period. Arbor reported huge increases for its second quarter ended Sept. 30, with revenue up 101%, to $10.8 million and net income up 300%, to $1.4 million.

Meanwhile, Prism Solutions, Inc., which provides data management and administration tools, reported revenue was up 25%, to $6 million for its third quarter ended Sept. 30, but new software license revenue was down. It also had a net loss of $1.6 million and noted that it had "hoped to do better in the quarter."

In addition, some analysts think warehousing stocks have been pricey this year, in part because of all the market hype.

"They got too richly valued back in the spring," says David Thomas, an analyst at First Albany Corp. "Look to see the prices fall some [because] they are still a little bit too expensive."

- Wait for what could be the big bonanza. For investors interested in initial public offerings (IPO), some analysts expect several more small warehousing companies — perhaps as many as a dozen, depending on market conditions — to go public between now and early 1998.

Investors should track some of the hotter players, particularly those specializing in data administration — which includes such functions as data extraction, transformation and cleansing — or data access. Two of the many companies to watch in that space are Vality Technology, Inc. in Boston and Brio Technology, Inc. in Palo Alto, Calif. Vality provides a set of tools to re-engineer corporate data for use in a warehouse, and Brio sells query tools.

In a prepared statement, Mark Atkins, Vality's president, confirmed that the company is considering a public offering in "the near term." Brio declined to comment on any specific IPO plans.

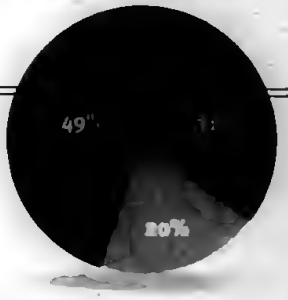
Some analysts say the best technique is to meld these three investment approaches and come up with a well-rounded warehousing portfolio.

"I would advise [investors] to pick a mix of aggressive plays and conservative plays and then pay attention to these new ones that will be going public," Thomas said.

But the key, analysts say, is to make sure investments are made in firms that show clear signs of addressing emerging user concerns. Just one example: Most user companies are focusing on small warehouses, or data marts, because big corporate warehouses are too expensive and take too long to develop.

Therefore, it is likely best to avoid a company that continues to sell exclusively enterprisewide warehousing. And, as always, sidestep companies that appear to be just one-trick ponies, analysts say.

Who's warehousing?



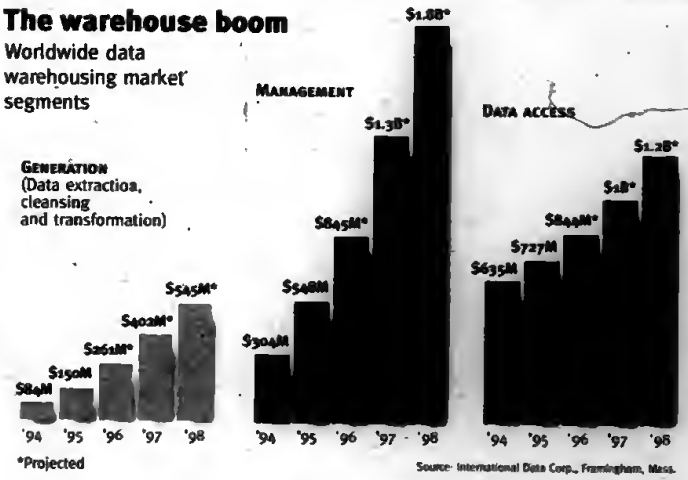
BASE: 200 COMPANIES

- Have an architecture and are actively warehousing
- Have a warehouse architecture
- Do not have warehousing plans

Source: Gartner Group, Stamford, Conn.

The warehouse boom

Worldwide data warehousing market segments



Source: International Data Corp., Framingham, Mass.

AUTOMATED SOFTWARE MANAGEMENT

Seminar Schedule

Atlanta	November 7	Montreal	November 5
Baltimore	November 13	Nashville	October 29
Boston	October 29	New York	October 31
Calgary	November 12	Orange County, CA	October 16
Charlotte	November 5	Orlando	October 30
Chicago	October 22	Philadelphia	November 12
Cleveland	November 6	Phoenix	November 19
Columbus	November 7	Portland	October 16
Dallas	October 24	Salt Lake City	November 13
Denver	November 14	San Diego	October 15
Detroit	October 24	San Francisco	October 17
Houston	October 23	Schaumburg, IL	November 8
Kansas City, MO	November 20	Seattle	October 17
Los Angeles	October 15	Stamford	October 22
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Minneapolis	October 23	Washington, D.C.	November 14

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The Week in Stocks

Gainers

PERCENT

Secure Computing Corp.(L)	33.3
Centura Software(L)	28.0
PeopleSoft(H)	23.9
American Power Conversion(H)	20.0
Vitalink Software Inc.	18.8
Softkey International Inc.	18.0
Compuware Corp.(H)	16.5
Hyperion Software Corp.	16.2

DOLLAR

Compuware Corp.(H)	7.75
Western Digital Corp.(H)	4.75
PeopleSoft(H)	4.50
Softkey International Inc.	3.63
American Power Conversion(H)	3.00
Secure Computing Corp.(L)	3.00
Adaptec Inc.	2.63
Hyperion Software Corp.	2.38

Losers

PERCENT

Octel Communications Corp.	-44.9
Spyglass Inc.	-30.7
Truevision Corp.(L)	-26.6
Compression Labs Inc.	-25.0
Electronic Data Systems Corp.	-23.7
Interleaf Inc.	-23.1
Compuserve Corp.(L)	-20.7
Stratologic Corp.	-20.0

DOLLAR

Electronic Data Systems Corp.	-16.63
Octel Communications Corp.	-13.25
Shiva Corp.	-7.75
Shared Medical Systems	-7.75
Spyglass Inc.	-5.38
Xylan Corp.	-5.25
Apollo Inc.	-4.88
Computer Sciences	-4.75

Industry Almanac

Vantive heads off sell-off

Sometimes good financial performance isn't enough to keep a company's stock from taking a beating.

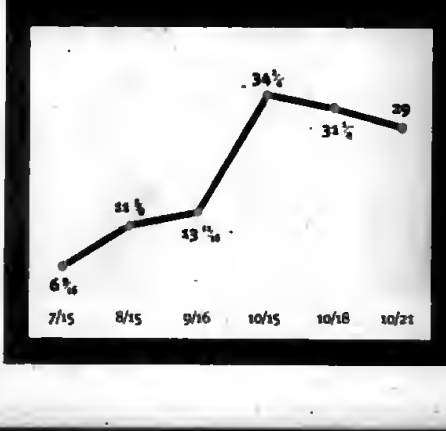
Vantive Corp., a manufacturer of information management and help desk software, is a case in point. The company has been steamrolling along since it went public last year, with revenue growth rates at about 150%. Vantive earlier this month reported third-quarter results that showed revenue of $17.2 million — a 161% increase compared with the same quarter last year. Net income was $3.1 million, up from $632,000 in the same period last year.

So how did Vantive upset investors so much that its stock plunged 23% to $31.25 in only one day? Following its earnings announcement, Vantive alerted Wall Street not to expect such great growth rates for the next two quarters. Stockholders didn't take kindly to the news, and a rapid sell-off of Vantive stock was under way.

Wall Street analysts say that although stockholders clearly overreacted, there is some underlying cause for concern. Analysts worry that Vantive may have been too slow in ramping up its sales force to maintain its rapid growth. In Vantive's highly competitive market, that could become a serious problem; its sales cycles are long, and salespeople need lots of expertise.

In response, Vantive last week said it had recently increased its sales force by one-third and plans to boost it by the same amount this quarter. — *Rosemary Cafasso*

Vantive bouncing back



Ticker	52-Week Range			Oct. 29 Stock Price 2 p.m.	Net Change	Net Percent Change
COMPUTER HARDWARE						
COMS	48 50	33 50	3Com Corp	42 50	-0 75	-1.7
AIT	66 88	49 63	Ames Rltech Corp	54.00	1.00	-1.8
T	49 88	38 13	AT & T	38 13	-3.75	-9.4
ASND	71.25	26.63	Ascend Communications	61.63	-3.38	-5.2
BNYN	13 63	6 50	Banyan Systems Inc.	6.88	-0.38	-7.1
BAY	50.00	18.63	Bay Networks Inc. (L)	19.88	0.13	0.6
BEL	60 38	43 50	Bell Atlantic Corp	50 00	-0.25	-0.6
BLS	45.88	35.25	Bellsouth Corp	38.88	1 13	2.8
BRK1	42.25	8 13	Brooktrout Technology	35 00	-0.50	1.4
CS	87.25	53 00	Cabletron Systems	60.00	-2.00	-3.2
CSCC	91.25	19 38	Cascade Communications	73.25	0 13	0.2
CGRN	24 13	12.25	Certirnan Communications	13 13	-1 50	-10.1
CSCO	67.00	32.00	Cisco Systems Inc	60.00	-3 38	-5.3
CLIX	9.25	4.50	Compression Labs Inc.	4.50	-1 50	-25.0
CMNT	30.50	6.00	Computer Network Tech.	5.44	-0.50	-9.4
XCOM	34.25	4.75	CrossCom	5.38	-0.75	-4.4
DIGI	43.25	34.00	DSC Communications (L)	34.00	1.63	10.4
FORE	44.25	18.75	FORE Systems Inc	38.75	0.50	1.3
GDC	21.88	8 13	General Datacomm Inds.	50.25	-0.63	-5.7
GSR	44.25	30.50	General Signal Networks	42 38	0 38	0.9
GTE	49.25	37.25	GTE Corp	41.75	0.75	0.6
LU	69.88	29 75	Lucent Tech (H)	68.88	1.75	3.2
MADGF	60.63	0.88	Madge Networks NV (L)	9.00	-1.00	-10.0
MCIC	31 13	22 38	MCI Communications Corp	25 38	0 16	1.8
MKPI	36.50	5.50	Microcom Inc.	8.88	-0 13	-1.4
NETM	38.00	6.44	NetManage Inc. (L)	6.69	-0.44	-6.1
NTRX	10 88	3.75	Netrix Corp	7 19	0.06	0.9
NCDI	10.25	2.88	Network Computing Devices	6.88	0.75	3.8
NWK	38.00	11 13	Network Equipment Tech	13.88	-1.75	11.2
NETG	27.63	15.00	Network General	24 50	-1 19	-4.6
NRI	37.25	13.88	Newbridge Networks Corp	29.25	-4.63	-13.7
NT	64.75	31 50	Northern Telecom Ltd. (H)	61.75	1.38	2.3
NOVL	39 13	25.88	Novell Inc. (L)	30.00	-0.75	-2.4
NYN	58.25	42.00	Nynex Corp	44.13	0.13	0.3
OCTL	31.75	12.63	Octel Communications Corp	16 75	-13.25	-44.9
ODSI	36.75	13.00	Optical Data Systems Inc. (L)	15.63	1.63	11.6
PAC	75.25	25.88	Pacific Telesis	34.88	-0 13	-0.4
PCTL	64.75	26.25	Picturetel Corp.	29 50	-4.38	-12.9
PTON	9.00	2.38	Proteon Inc	2.88	0 13	4.5
RACO	7.00	3 50	Racotek Inc.	5.00	-0.44	-8.0
RETX	50.88	1.81	Retix	5.88	1.00	-14.5
SBC	50.25	46.00	SBC Communications	48 75	-0.25	-0.5
SFA	20.38	11.38	Scientific Atlanta Inc.	14 83	1.88	11.4
SHVA	87.25	75 13	Shiva Corp	38.25	-7.75	16.8
FON	45.50	38.25	Sprint Corp	38.38	-0.38	1.0
SMSC	23.50	10.25	Standard Microsystems Corp.	12 50	-0 50	-3.8
TBIT	13.88	2 38	Telebit Corp	13.25	0 00	0.0
USRX	105 50	32.75	US Robotics	20 13	-4 38	-5.9
USW	39 38	27.25	US West Inc.	30 13	-0.88	-2.8
XIRC	21.75	8.88	Xircom (H)	20.25	0 38	1.8
XYLN	76.00	16.00	Xylan Corp	43.00	5.25	-10.9
PERSONAL COMPUTERS						
AALR	10.38	5.88	Advanced Logic Research	8 50	0.63	7.9
AAPL	42.50	16.00	Apple Computer Inc	34.75	1.75	4.6
ASTA	29.25	4.00	AST Research Inc	4.50	-0.25	5.3
CPQ	75.38	35.00	Compaq Computer Corp	75.00	1.38	1.9
DELL	68.25	23.00	Dell Computer Corp	61.00	0.50	0.6
GATE	57.63	18.00	Gateway 2000 Inc.	51.25	1.63	4.6
HWP	57.75	38.88	Hewlett-Packard Co.	45.63	1.88	3.9
MUEI	23.50	8.75	Micro's International Inc.	18.25	-2.00	-9.9
NIPNY	69.88	49.88	NEC America	54.00	3.00	-5.3
SGI	38.75	19.50	Silicon Graphics (L)	19.50	1.00	-4.9
SUNW	70.25	34.25	Sun Microsystems Inc	59 38	-1.00	-1.7
MINICOMPUTERS						
AMH	13.50	6.75	Amdahl Corp	8.94	0.00	0.0
DGN	19.13	9.00	Data General Corp	14.25	-1.00	-6.6
DEC	76.50	28.38	Digital Equipment Corp (L)	29.75	-4.50	-13.1
IBM	135 38	83 13	IBM (H)	127.25	0.50	0.4
MDCD	20.29	6.50	Meridian Data Inc.	7.75	0.38	5.1
NETF	6.50	2.38	NetFrame (L)	3.56	0.69	23.9
SQNT	19 13	10 13	Sequent Computer Sys.	14.88	0.88	6.3
SEQS	7 38	1.88	Sequoia Systems Inc	2.50	-0 13	-4.8
SPA	57.63	18.00	Spreadtree Computer Inc	33.63	-3.00	-8.2
TDM	15.25	8.38	Tandem Computers Inc.	12 50	0.50	4.2
UIS	9 13	5.38	Unisys Corp	6.38	-0.88	12.1
SOFTWARE						
ADBE	74.25	28 50	Adobe Systems Inc	34 13	2 50	-6.8
AMSWA	8.75	3.63	American Software Inc.	5.75	-0 31	-5.2
APLX	42 50	12 13	Applix Inc.	26 25	-4.88	-15.7
ARSW	82.75	38.25	Arbor Software	46.88	0 38	1.0
ADSK	44.25	30 50	Autodesk Inc	32.75	+0.25	-1.1
BGSS	50 00	29.75	BGS Systems Inc	40.25	+2.25	-6.0
BMCS	86.25	12 50	BMC Software Inc	51 00	1.25	1.5
BOOL	26.75	19.75	Boole and Babbage	26.00	0.50	2.0
BORL	21.25	6.88	Borland Int'l Inc. (L)	5 38	+0.19	3.6
BOBY	55.50	31.25	Business Objects	37.50	0.38	2.7
CAYN	31.88	4.00	Cayenne Software Inc.	5 50	0 11	6.2
CNTR	8 13	2.88	Centura Software (L)	4.00	0 00	28.0
CYE	30.63	14 13	Cheyenne Software Inc	30.25	0.13	0.4
CGNF	30 13	10 50	Cognos Inc	32 13	0 38	1.2
CA	68.75	32 13	Computer Associates	50.88	-1.50	2.5
CVN	15.50	5.75	Computervision Corp.	9.00	-0.63	-6.5
CPWR	55 50	15 50	Computware Corp. (H)	54.75	2.75	36.4
CSRE	32.00	20.75	Comshare Inc.	24 38	-0 38	2.5
COSFF	50 13	8.88	Cond. Corp	8.25	-0 19	2.3
DWTI	13.00	3.25	Datawave Technologies Inc.	6.88	0.00	0.0
FILE	67.00	20.00	Filenet Corp	30.94	0 19	0.7
FFTE	81.25	24.75	Forte Software	42.50	-0.88	-2.0
FTPS	40 63	5.63	FTP Software Inc (L)	5.63	-0.88	-13.5
HUMCF	40 50	23.00	Humminbird Comm. Ltd.	29.63	-1.75	5.6
HYSW	75.25	9.75	Hyperion Software Corp.	19 13	2 38	14.2
IFIC	36.25	10.00	Information Resources	13.44	-0 31	2.2
IFMX	36.75	16.88	Informix Corp.	22.94	-2.19	-8.7
INGR	30 13	14.63	Intergraph Corp.	9.25	-1.63	-14.9
LEAF	12.63	2.00	Interleaf Inc.	2 50	-0.75	-23.1
ISLI	50.00	7 50	Intersolv Inc.	8.75	-0.50	-5.4
INTU	89.25	29.88	Intuit Inc (L)	28.25	1.25	4.6
LGWX	22.25	5.38	Logic Works	6.00	-0.75	13.1
MAPS	22.25	2.50	Mapinfo Corp.	12.25	0.25	2.1
MATH	9.25	3.25	MathSoft	4.50	-0.06	-1.3
MCAF	52.88	14.00	McAfee Associates	67.00	3.00	-7.3
MENT	22.88	8.88	Mentor Graphics	9.00	-0 13	-1.4
MFGY	21.25	9.25	Micro Focus	16.88	1.75	-7.8
MGXI	18.63	5.63	Microgrape Inc.	6 13	-0.06	-1.0
MSFT	139 13	79.00	Microsoft Corp.	107 38	2 38	1.8
ORCL	46.38	26.38	Oracle Corp	42.75	1.50	-3.4
PMTC	56 50	25.88	Parametric Technology	49.88	-1.63	-3.2
PARQ	14.63	2.25	ParcPlace Systems Inc.	2 50	-0.38	-13.0
PSFT	80.50	36.25	PeopleSoft (H)	80.50	4.50	5.3
PTEC	29.38	10.63	Phoenix Technologies	17.25	-1 38	-7.4
PSQL	33.50	3.13	Platinum Software (H)	12.00	-0.75	-5.9
PLAT	36.75	9.25	Platinum Technology	24.13	-0.63	-2.5
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RNBO	75 50	14.13	Rainbow Technologies Inc	50.25	0.00	0.0
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SAPE	58.25	29.25	Sapient Corp	46 50	-0.75	-1.6
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SDTI	109.00	27.25	Security Dynamics Tech.	72.25	1.25	1.7
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SPCO	4.25	3 19	Software Publishing Corp	3.50	-0.88	-5.0
SQAX	39.25	16.00	SQA Inc.	25.75	3.25	9.6
SOTA	19.75	9.19	State of the Art	11 38	-0.50	-4.2
SSW	81 38	28 25	Sterling Software Inc.	33.13	1.00	3.1
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SYBS	38 75	13.50	Sybase Inc.	17.25	-3.50	-7.0
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WANG	30.13	15.38	Wang Laboratories Inc.	21.50	-0.50	-2.3
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AOL	71.00	22.38	America On-Line	25.75	1.00	4.0
BBN	48.75	15.63	BBN Corp	30.88	1.88	6.5
CSRV	35.50	8.63	CompuServe Corp (L)	8.63	-2.25	-20.7
EDFY	55.75	15.50	Edify Corp	16.50	0.00	0.0
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NETC	91.50	13.25	Netcom On-Line (L)	13.25	-2.25	-14.5
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OMKT	42.25	11.50	Open Market Inc.	22.25	0.00	0.0
PSIX	29.00	6.75	PSINet	10.00	-0.75	-7.0
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RAPT	30.25	12.75	Raptor Systems	22.88	0.75	3.4
SCUR	44.50	9.88	Secure Computing Corp. (L)	12.00	3.00	33.3
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YHOO	63.00	15.50	Yahoo! Inc.	20 75	1.19	6.1
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LSCC	40.25	19.75	Lattice Semiconductor	33.50	-0.06	-0.2
MCRL	25.50	12.00	Micrel Semiconductors Inc	21.00	0.25	1.2
MU	74.63	16.63	Micron Technology	28.50	3.63	14.3
MOT	68.63	44.75	Motorola Inc.	47.63	-1.00	-2.1
NSM	27.29	11.88	National Semiconductor	18.63	-0.63	-3.2
TXN	72.00	40.50	Texas Instruments	50.38	-3.13	5.8
VLSI	36.63	50 38	VLSI Technology	50.00	0.00	0.0
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ZLG	40.38	16.88	Zilog Inc	19.25	-2.00	-9.2
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APCC	19 50	7.00	American Power Conversion (H)	19 50	3.75	29.0
ADPT	66.75	35.00	Adaptec Inc.	61.38	2.63	4.5
CDEX	30.63	3.00	Cabletron Corp	3 13	-0.38	-10.7
CREAF	12.25	3.50	Creative Technology Ltd.	5.25	0.75	3.4
RACE	12.75	3.63	Data Race Inc.	11.38	0.44	4.0
DTM	8.88	4.13	Datatrak Corp	7.38	0.25	3.5
EMC	27.75	13.25	EMC Corp (H)	26.13	0.13	0.5
EMUL	21.38	6.38	Emulex Corp	17.00	0.63	3.8
ESCC	89.00	19.00	Evans and Sutherland	22.00	6.25	39.5
EXBT	72.25	23.38	Exabyte	33.38	-0.31	7.3
IFAF	4.13	1.44	Intelligent Info. Systems	1.50	-0.00	-3.6
IOMG	55.13	3.25	Iomega Corp	22.50	1.75	-7.2
IPLS	8.25	1.63	IPL Systems Inc (L)	1.88	-0.13	-6.3
KMAG	57.00	17.63	Kimag Inc	27.25	-0.50	1.8
MTSI	22.75	11.29	Micro Touch Systems Inc	18.63	-0.63	3.8
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AQM	6.75	3.75	QMS Inc	5.00	-0.00	0.0
QNTM	36.13	20.88	Quantum Corp	30 75	0.50	2.5
RDUS	4.88	0.56	Radius Inc.	1.69	-0.13	8.0
SEG	69.00	36.13	Seagate Technology	46.13	0.25	0.6
STK	64.50	22.00	Storage Technology (H)	41.75	2.38	5.2
STLC	8.75	1.29	Stratologic Corp	1.25	-0.13	30.0
TEK	59.75	29.75	Tektronix Inc	40.75	-1.50	3.6
WDC	40.25	14.38	Western Digital Corp (H)	40.25	4.75	30.7
XIRC	58.25	39.88	3Com Corp	46.50	-1.38	-2.9
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AMSY	33.38	17.50	American Mgmt Systems	32.13	0.38	1.2
ANLY	25.75	11.63	Analysts Int'l	24.75	0.00	0.0
AUD	41.75	36.88	Auto Data Processing	41.38	-0.75	0.0
BDM	61.50	24.25	BDM International Inc.	31.88	2.00	-3.8
CATP	37.25	13.88	Cambridge Tech Partners	31.88	-2.38	-6.9
CEN	54.88	38.63	Ceridian Corp	40.75	2.50	-4.8
CDO	33.00	19.88	Comdisco Inc.	30.25	-0.69	-2.8
CMRZ	54.00	11.00	Computer Horizons	27.38	0.38	1.4
CSC	82.75	64.13	Computer Sciences	75.38	4.75	-5.9
TSK	36.75	15.50	Computer Task Group (H)	30.75	1.75	5.0
CPU	61.75	32.88	CompUSA Inc.	50.63	-3.25	-5.6
CDAT	28.63	13.19	Control Data Systems Inc. (H)	22 50	-3.38	-13.0
EGGS	13.88	5.00	Egghead Discount Software	6.00	-0.25	-4.0
EDS	63.38	46.00	Electronic Data Systems Corp	47.00	16.63	23.7
INAC	38.50	9.63	Inacom Corp (H)	39 13	-0.50	-1.3
INEL	11.50	3.50	Intelligent Electronics	9.00	-1.00	-10.0
KEA	46.29	38.25	Keane Inc.	40.25	-0.25	-0.5
MICA	19.29	7.75	Micropro Int.	17.88	-0.25	3.6
PAYX	63.63	26.63	Paychex	57.75	1.00	-3.9
PMS	55.50	33.13	Policy Management Sys.	35.63	-0.25	-0.7
REY	28.25	17.61	Reynolds and Reynolds	26.38	0.25	1.0
SCBI	30.50	14.44	SCB Computer Tech Inc.	20.13	0.13	0.6
SEIC	26.38	17.75	SEI Corp	20.25	-0.61	-3.0
SMED	72.13	37.38	Shared Medical Systems	67.75	7.25	-14.0
SSPE	30.50	17.00	Software Spectrum Inc.	27.00	1.00	3.8
VSI	29.75	9.00	VanStar Corp	25.00	-1.75	-6.3
SNDT	47.50	25.25	Standard Data Systems	43.25	1.50	-3.4

KEY (H) = New annual high reached in period (L) = New annual low reached in period

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Microsoft tools link Web apps to corporate databases

By Mitch Wagner
and Kim S. Nash

Microsoft Corp. this week plans to unveil tools to link World Wide Web applications to corporate databases as well as s new proxy server and a new version of its Web server.

Also st the Microsoft Site Builder Conference in San Jose, Calif., the company will announce Internet Studio. The application development tools were designed to build Web applications that access data stored in corporate databases using Open Database Connectivity interfaces. Also included will be support for ActiveX controls to build client-side programs for accessing data oo the Web, according to sources briefed by Microsoft.

Internet Studio will be available by the first quarter of next year.

A new version of Internet Information Server will enter beta testing today and will be available by the first quarter of next year, said Tanya van Dam, s group product manager at Microsoft in Redmood, Wash. The software will include capabilities, code-named Denali, that were designed to let users embed server-side scripts, ActiveX and Component Object Model objects on Web pages.

In an announcement not related to the show, Microsoft plans to ship s server to help information systems managers control end-oser access to the Internet.

Proxy server

The $995 Proxy Server works with non-TCP/IP networks such as IPX. It is integrated with Windows NT Directory Services to combine user access permissions and security settings on the Internet gateway with existing NT Servers. The product also automatically caches Web pages, which can speed up Web surfing.

Users can download Proxy Server for s free 60-day trial period from Microsoft's Web site (www.microsoft.com).

And Microsoft will outline plans for s new, low-cost personal computer, to compete with network computers, *The Wall Street Journal* reported Friday. Uflike network computer proposals from Oracle Corp. and Sun Microsystems, Inc., the Microsoft proposal will run on Intel Corp. processors and use Microsoft operating systems.

Supporters of Microsoft's proposal will include Hewlett-Packard Co., Compaq Computer Corp, Dell Computer Corp. and other PC makers, according to the *Journal*.

Microsoft officials said the *Journal* report is accurate but incomplete.

OS road map

CONTINUED FROM PAGE 1

it plans to have one common operating system kernel. But the company has been noticeably mum about exactly when and how it will accomplish that.

Users and analysts said they are eager for actual product demonstrations and pre-alpha copies of the software, some of which also will be announced at the Microsoft Site Builder Conference this week (see story sbove).

Michael Gartenberg, an analyst at Gartner Group, Inc. in Stamford, Conn., said Microsoft has been remiss in not presenting s definitive picture regarding the future of its two desktop operating systems.

Gartenberg said although there is currently no real migration path to take users from Windows 95 to Windows NT 4.0, be expects Microsoft to develop a good path between Windows 95/97 and Windows NT 5.0, code-named Cairo. "If Microsoft didn't, there would be s revolution. NT 5.0 will not ship unless there's s path. And once there's s path, you won't go back," he said.

> "The reality is that the migration path is a nightmare."
>
> —*Pompi Malik, Brewers Retail*

Representatives at seven Fortune 500 firms interviewed by *Computerworld*, including Monsanto Co., Lockheed Martin Corp. and Kaiser Permanente Health Plan, Inc., agreed.

"I say hip, hip, hooray to s single operating system kernel — Windows NT — even if there's pain involved in getting there," said Tom Boos, senior vice president of information technology services and development at the Coris division of R. R. Donnelley & Sons Publishing Corp. in Chicago. "I want consistency. Right now, the variations among Windows 3.1, Windows 95, Windows NT and the IBM OS/2 Warp platforms are driving us nuts," he said.

R. R. Donnelley's Tom Boos: *'I say hip, hip, horray to a single operating system kernel'*

Boos said many of his end users — and R. R. Donnelley's network administrators and internal software engineers — worry about what will happen if Microsoft gets rid of Windows 95 in favor of Windows NT Workstation.

"It's crucial for Microsoft to protect the upgradability of the applications I develop and ensure backward and forward compatibility," Boos said. "No one wants to spend exorbitant amounts of money buying all new Microsoft OS licenses. That's one reasoo s lot of users — us included — want to hang on to our 16-bit apps."

Interoperability is another big concern.

"Windows NT and Windows 97 may look the same externally, but the kernels are different. The reality is that the migration path is s nightmare. I don't know how they're going to do it," said Pompi Malik, an information systems manager at Brewers Retail, Inc., s large beer distributor in Mississauga, Ontario.

Sources at Microsoft said the company plans to quell those concerns and quash criticism of its Internet strategy with s raft of demonstrations and briefings at its conference next week. Attendees will receive pre-alpha versions of some key software packages, including the Slate systems administration utility, sources close to Microsoft said.

Other highlights will include the following:

- A beta version of Internet Information Server 3.0, which will contain support for ActiveX Server pages. This will make it easier for third-party developers to create dynamic World Wide Web applications using Microsoft's Visual Basic and Java scripts.
- A preview of Microsoft's implementation of the Java Virtual Machine, which will let businesses run Java applications on Windows NT Server.
- A demonstratioo of Microsoft's transaction server, code-named Viper, which was designed to simplify development of integrated Windows NT Server and Internet applications.
- A demonstration of Cedar, the code name for an upcoming SNA Server software technology that will let users access mainframe transactions via Microsoft's Internet Explorer.

Intranets trip on client/server

CONTINUED FROM PAGE 1

for the following reasons:

- There is too much application logic oo the client side.
- Platform-specific coding isn't easily translated.
- Client/server tools vendors lag in adding web features to their products.

Moreover, the model that made client/server appealing — moving chunks of application logic from big mainframes to desktops and using smaller, cheaper server machines — doesn't cut it in an intranet world, several users said.

Scrapping fat clients

When John Deere & Co.'s Engine Works division in Waterloo, Iowa, replaced applications with intranets, most client/server systems "with fat clients had to be scrapped," said Phyllis Michaelides, head of the division's technology architecture team, at s recent seminar.

Intranets

For example, s shop floor application built with Apple Computer, Inc. Macintosh Hypercard tools had to be rewritten, Michaelides said. "There's no salvaging those with heavy front ends," she said.

Although not all client/server applications will be replaced ont of hand, none of the mainframe programs at the Engine Works division must be heavily modified, she said.

The Texas Comptroller of Public Accounts recently learned s similar lesson. The agency scaled back plans to move a state system from IBM mainframes to a client/server setup using PowerBuilder, Sybase, Inc. databases and RS/6000 Unix boxes.

"That was the recommended architecture proposed by Gartner Group, but it turns out that we have too mupb data," said Stuart Greenfield, s software analyst at the agency in Austin, Texas. "Using a browser-type front end for the mainframe is going to be a lot easier."

Chubb & Son, Inc., an insurer in Warren, N.J., is testing a handful of web-based terminal emulation products that let browser users access IBM DB2 and IMS databases on mainframes.

The company's client/server applications, though, are largely separate from its intranets. That is because "it's not clear to us at all how to bring them together," said Duvid Belsky, s senior technical analyst at Chubb.

"People here are starting to say, 'Maybe the ultimate web server is the MVS host,'" Belsky said.

"With older host-terminal apps, it's just an interface you have to write," said Jay Vander Wall, a technical architect at Dow Chemical Co. in Midland, Mich.

Also blocking client/server's way onto intranets are programs that were built for a particular operating system, said Rick Villars, an analyst at International Data Corp. in Framingham, Mass. "You see s lot of quirks in the code particular to s certain platform that may or may oot work in s browser," he explained.

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New season for The Microsoft Network

With the relaunch of its online service, Microsoft is doing it again. The company is raising the ante, forcing competitors such as America Online, the crumbling CompuServe and hundreds of World Wide Web sites to improve what they're doing if they want to stay in the game. And as has often been the case, Microsoft is doing this from a position of relative weakness.

It's hard for outsiders to think of Microsoft as an underdog, but its big successes (DOS, Word, Excel, Office and NT) have come in markets in which the company started out well behind entrenched competitors.

If history is our guide, The Microsoft Network (MSN) is about to become a big success. Even with its 1.6 million members, the new MSN is being launched from a position well behind AOL and CompuServe.

If it's successful, MSN will have a subtle but perceptible effect on everything online, just as the influence of MTV has spread across broadcast, cable and even corporate television. Not to mention what MTV has done to popular culture.

The TV comparison is apt because the new MSN isn't so much an online service as an online network. MSN brings TV concepts — including shows, seasons and cancellations — to the online world.

Online flash

It's a "hits business," according to the service's executive producer, who promises midseason replacements if the shows don't draw enough ratings. And just like TV, the service tends more toward style than substance — start digging down in MSN, and you'll quickly come out the other side.

So how does all this work? To access MSN, you'll use a special version of Microsoft's Internet Explorer called the Program Viewer, which uses 30M to 50M bytes of ActiveX controls.

Microsoft has essentially plopped a new proprietary network onto the Internet. Sure, it uses TCP/IP and provides access to Web sites and other 'net resources, but without the special browser, you're toast.

The special browser, with its extra buttons and black-and-silver user interface, lets you visit MSN's new On Stage section. This is where six channels of "Web shows" live, each demographically programmed to attract members of our society's ruling class and their children. Across the six channels are about 20 Web shows, including dramas, comedies, travel, history and news.

The individual shows (not including MSNBC) cost from $100,000 to $1 million per 13-week season to produce; the higher-priced shows have big start-up costs that jack up the first-season price. To my knowledge, AOL doesn't have anything to compete on a dollar-for-dollar basis.

But AOL will, and someday you may as well. If the new MSN is a hit (and remember, Microsoft is spending $100 million to promote the launch and isn't predicting profits for three years), it will change your users' perceptions of the Internet and your corporate intranet.

Will your company's human resources site turn into a daily drama? Probably not, even though most HR departments seem pretty much like a soap opera to me. But in bringing a TV metaphor and sensibility to the online world, the new MSN will certainly shake things up — for the better.

Coursey, an analyst and consultant, is editor of "coursey.com," an online newsletter available at www.coursey.com. His new life goal is to become the Ed Sullivan of the MSN.

Inside the Kingdom, the subjects speak

More than 5,600 IT types gathered at Disney World in Lake Buena Vista, Fla., recently to hear Gartner Group analysts talk about trends in IS management. But often the attendees' talk in the hallways, around the tables in the luncheon tent and by the steaming coffee urns was more enlightening.

In such a crowd, it wasn't easy for acquaintances to find one another. "Where are you staying?" one would ask. When the hotel was named, the follow-up query would be, "Is that inside the Kingdom?" referring to the sprawling Disney grounds sometimes known as the Magic Kingdom.

William S. Hutton is a vice president of claims process re-engineering at USAA Property and Casualty Insurance Group. (I didn't know there *were* vice presidents for re-engineering.) He said something that sounded as prophetic as anything uttered by an analyst. After standing in line to get lunch, he said:

"From gatherings like this, it's clear that most American business ***a****anderesti-mates the size of the economy. IT will take up an increasing share of the budget because of its close relationship with future growth. The companies that don't invest will lose the business."*

Invest aggressively in IS or lose your future customers?

In an era marked by cost containment, downsizing and skepticism of IS, Hutton struck a heretical but realistic note. The right thing to do, he said, was to spend now in hopes that you won't be left behind in the future.

Donald Hirst, vice president for network services architecture at the Chicago office of Dutch banking giant ABN-AMRO Services, was diligently filling out a speaker evaluation form after a session on security when I interrupted him. What did he think after hearing the speaker's warnings?

"Right now, we have lots of dial-in modems, access from outside the firewall. But we also have a very active program to put in secure remote access through a third-party provider," he said. "Users dial up the third party, who gives them access over secure lines. We're removing the direct dial-in capability [as a security risk]. Our strategic direction is to move [10,000 users] over to Windows NT as fast as possible because of the greater desktop security."

Mikaele Racine, a client/server technical support manager at chemicals maker Rohm and Haas in Philadelphia, helps maintain the information that goes into directories for Novell's NetWare, Lotus Notes, CC:Mail, the corporate telephone book and human resources.

"We would like to put all this information in one directory, or at least have the different directories talk to each other. We want to move toward an X.500 directory and LDAP," he said.

A large, bulky X.500 directory can function as a universal directory across applications. Lightweight Directory Access Protocol (LDAP) is a directory specification small enough to sit on a client and make the connection to the corporate directory.

The year 2000 problem received its share of attention. Said Mary Ellen Dobbins, assistant director of the Justice Data Center at the Florida Supreme Court in Tallahassee, who started her career as a Cobol programmer:

"We never dreamed we'd be around when the year 2000 came. We thought the code we were writing in the 1970s would be replaced in 10 years. It's still around, and so are we."

Babcock is *Computerworld*'s technical editor. His Internet address is charles_babcock@cw.com.

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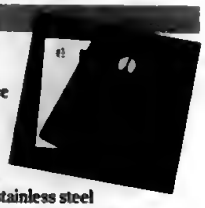

Cybershoppers may soon have an "electronic wallet" that lets them make online purchases with peace of mind. Dallas Semiconductor (www.ibutton.com) has developed a wallet that features the Cryptographic IButton, a specialized computer chip encased in a stainless steel button. The button acts like a smart card and holds the user's financial data in encrypted form. Users touch the button to the Dot Receptor computer interface to conduct secure transactions.

A small change-purse version is already deployed in China, Brazil, Argentina, Canada and Turkey. Transit riders in Istanbul quickly pay fares by touching the IButton to a Dot Receptor as they go through the turnstiles.

Security features of the IButton include a high-speed random-number generator for public-key encryption, a large key size of 1,024 bits and an internal time clock to time-stamp transactions. Furthermore, any effort to open or tamper with the steel button immediately erases the chip's memory.

Waiting FOR downloads

The Web has already benefited mankind by producing "bonus" increments of time – those precious moments spent waiting for Web pages and graphics to fill the screen. *The Washington Post's Fast Forward* magazine recently asked readers what they do with their online downtime and got the following responses:

- **Study tax law.** (This was Washington, after all.)
- **Floss my teeth,** but that tended to make splatter marks on the monitor.
- **Do laundry** (load, add fabric softener and fold).
- The operative words are **"picking"** and **"nose."**
- **Clean my keyboard** with 409 and Q-Tips.
- **Doodle** with Crayola crayons (the 64-color box).
- **Stare at the screen,** using my brain at full psychokinetic strength to "will" the image to appear.

Here at alt.cw, we use the time to discard press releases and send faxes. What do you do while Web-waiting? Send your stories to mbetts@cw.com.

High-quality glare filters, *such as this model from GlareGuard in Santa Rosa, Calif., can reduce eye strain and headaches, a new study confirms (see story below). The glare filters cost between $20 and $70.*

Human Factors

Ergonomics expert Alan Hedge is usually a skeptic about ergo-gadgets that claim to help people who suffer from wrist injuries and eye strain because of computer work.

But Hedge, who is professor of human factors at Cornell University in Ithaca, N.Y., said high-quality filters that cut screen glare really reduced the "tired eyes" and headache complaints of computer users. "This was a complete surprise. A glare filter works for most sufferers," he said at an ergonomics conference in Philadelphia.

Hedge and other researchers conducted a rigorous study of 171 full-time computer users at Honeywell in Phoenix. Bothersome screen glare was reported by three-quarters of the workers, but that dropped to less than one-third of the workers after high-quality glass filters were installed.

Furthermore, 81% of the users said the filter made the screen easier to read, and 73% said screen text was clearer. There was one complaint: The glare filters make the screen darker. — *Mitch Betts*

Inside Lines

Cold Warrior plays Microsoft's game

Microsoft has hired one of the most notorious information warriors of the Cold War, an ex-Soviet operative responsible for sapping *millions* of staff-years of productivity from U.S. knowledge workers: Alexey Pajitnov, the inventor of Tetris. Pajitnov will work in Microsoft's games unit. Hopefully the unit will ship his products only to Iraq and other countries we don't like, so they, not us, can spend endless hours staring at the screen.

Execs verklempt for Dole/Kemp

Fed up with what they see as a pro-Clinton bias from the national press, a group of some 243 Silicon Valley executives this week plans to release an open letter trumpeting their support for the Dole/Kemp ticket (see @Computerworld, www.computerworld.com, for related story). The Silicon Valley revolt is a turnaround from 1992.

Michigan cops stung by break-in

A program intended to help police departments keep track of case records "eats up" data over time, according to an officer in Michigan, where about 25 departments use the tool. One department reportedly lost about four years' worth of data. The software was created by a local developer who is now the subject of a manhunt.

Not with my daughtURL, you don't

The back cover of *Going to the Net: A Girl's Guide to Cyberspace* (Avon Books, New York) lists lots of reasons young grrls with URLs ought to buy this new book: games, education, research, shopping, fitness. But what are we to make of this one? "Make new friends (zillions of boys are on the net!)." Just remember, girls — on the Internet, no one knows you're a sleaze.

Strengthening the wall

Optimal Networks this week will detail plans for a package that will fortify security firewalls. Optimal's Windows-based Internet Monitor logs addresses of outside users who gain network access. After determining which users are unauthorized, Internet Monitor sends those addresses to firewalls from Ascend Communications, which block network access to those parties. Internet Monitor costs $1,500 and will be available in the first quarter.

JavaSoft won't be snubbed

Microsoft thumbed its nose at JavaSoft but may realize that it doesn't pay to spit in the wind. Microsoft is holding its Professional Developers Conference in Long Beach, Calif., next week. JavaSoft wanted in on the fun, but Microsoft refused. It's their party, and they'll have no crashers. Not to be snubbed so easily, JavaSoft is staging its own developers conference — across the street.

Year 2000 gallows humor

The looming date-change crisis of the year 2000 is no laughing matter. But Giga Group analyst David Gilmour managed to get some genuine guffaws last week at the Technology Forum '96 Conference in New York, where he told a room full of IS execs: "On New Year's Eve 1999, you'll all be in your network control centers with your resume in one hand and a beeper in the other!"

Here are some new voice-mail options we heard recently. "If you are a psychotic killer, put down the knife and press one. . . . For Oedipus complexes, have your mother help you press two. . . . For paranoia, make sure no one's watching, then press three. . . . And for codependency, press four — if it's OK with everyone else." We'd love to get voice mail from you. Just dial up news editor Patricia Keefe at (508) 820-8183. Or E-mail her at patricia_Keefe@cw.com.

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HOW CAN SOMETHING SO FAST HANDLE SO WELL?

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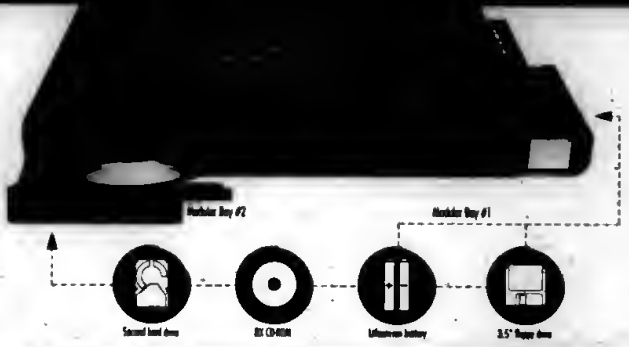

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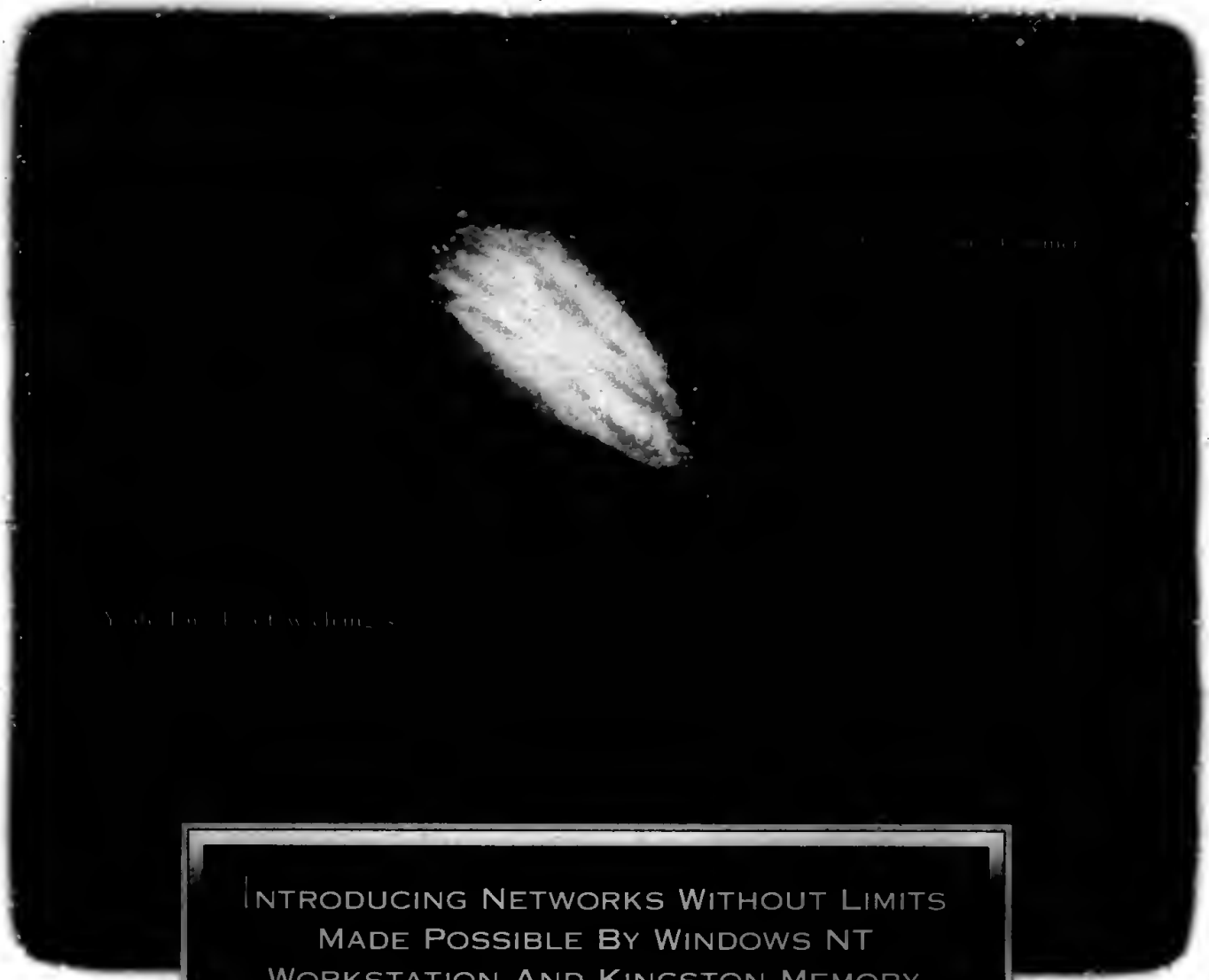

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